[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR PROCESSING MULTI-CURRENCY TRANSACTIONS AT A POINT OF SALE
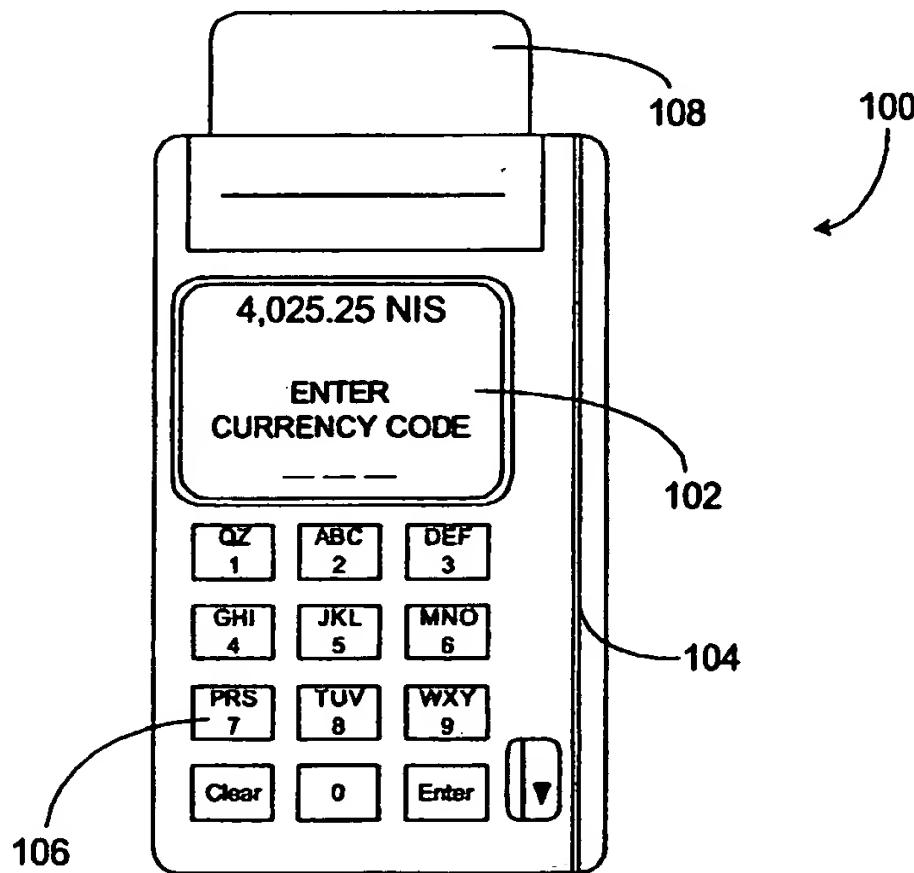
(57) Abstract: A system and method are described for supporting non-cash transactions in multiple currencies. The system includes software which determines if a transaction is in a locally processed currency or a non-locally processed currency and proceeds according to such determination. The system also includes a multi-currency payment platform which uses software to interface a point-of-sale terminal with a voucher receiving module and a database system so as to enable the point-of-sale terminal to download current exchange rates for particular currencies. When a cardholder wishes to know the value of the transaction in a particular currency, the point-of-sale terminal provides the cardholder with the exact amount that will be charged in that currency at the time of receipt of the cardholder's statement for the card. The software gives the point-of-sale terminal the capability to recalculate the transaction amount from the currency in which the merchant has priced the transaction (usually the local currency) into the currency of the cardholder's choice, and allows a choice to be made as to the currency in which the transaction will be processed. In addition, the merchant receives settlement in the currency of his choice, which will not necessarily be the merchant's local currency.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

SYSTEM AND METHOD FOR PROCESSING MULTI-CURRENCY TRANSACTIONS
AT A POINT OF SALE

CROSS-REFERENCE TO PRIORITY APPLICATION

Applicant claims the benefit of United States

5 Provisional Patent Application No. 60/274,044 entitled

"SYSTEM AND METHOD FOR PROCESSING MULTI-CURRENCY TRANSACTIONS

AT A POINT OF SALE" filed 06 March 2001, which application is

hereby incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

10   The invention disclosed herein relates generally to a

new and improved system and method for enabling non-cash

transactions at a point-of-sale to be accomplished in a

currency chosen by a cardholder. More particularly, the

present invention relates to a new and improved system and

15 method for allowing a cardholder to appreciate, at the time

of a purchase, the precise purchase price of an item or

service in the cardholder's currency of choice, even if the

chosen currency is not otherwise capable of being locally

processed.

20   Existing point-of-sale systems in which a cardholder

pays for a purchase using a card allow transactions to be

accomplished only in locally processed currencies.

Accordingly, if a purchase is made in a locality in which a

different currency is used, the cardholder is left with some

25 uncertainty as to the actual price of the purchased item or

service in the cardholder's currency. It is not until the

cardholder actually receives a statement for the card used
that the cardholder knows the exact exchange rate used to
determine the cost of purchase. In the case of purchases of
significant value (e.g. purchases of jewelry, art, etc.),
5 even a small fluctuation in exchange rate between the date of
purchase and the date of processing the transaction in the
cardholder's currency could lead to a large differential in
the cost of the transaction to the cardholder. Considerable
dissatisfaction often results from the cardholder's not
10 knowing at the time of purchase what will be the exact price
of the transaction on the statement.

Even after reviewing the periodic billing statement, the
cardholder is often confused as to how the transaction amount
is derived and is often uncertain as to whether the amount
15 reflects competitive exchange rates or even whether the
amount bears any relation to the original transaction. The
amount billed for each transaction involves one or more
currency conversions/exchanges, and is thus directly impacted
by the fluctuation of the exchange rate(s). The cardholder
20 is often charged one or more fees by the card issuer for
exchange services for each transaction. The cardholder will
often question the amount charged for the transaction as a
result of the ensuing exchange rate(s) and the complexity of
the periodic billing statement itself.

25   Even if exchange rates do not fluctuate, the cardholder
will not know the exact price until receipt of the periodic

2

billing statement because he/she doesn't know what exchange

rates are applied by the card issuer. In addition, the

cardholder is further inconvenienced with the need to

initiate and follow through on an inquiry with the card

5 issuer or the merchant. In a more extreme case, the

cardholder might even initiate a challenge or chargeback of

the transaction.

Merchants have problems with the current system as well.

Since transactions denominated in a currency other than that

10 of the card are relatively complex for the cardholder to

understand, they tend to lead to more frequent cardholder

inquiries on the transactions that appear on the cardholder's

periodic billing statement as well as cardholder requests for

a challenge or chargeback regarding such transactions. A

15 cardholder's challenge or chargeback request is typically

made to the card issuer and is directed to the merchant

acquirer, and finally to the merchant associated with the

specific transaction. If the challenge or chargeback process

is directed through the postal service, significant delays

20 can occur in the completion of this process.

The merchant incurs costs for following up on

inquiries, challenges and chargebacks. Each challenge or

chargeback request requires the merchant's research and

response, which impairs the merchant's productivity.

25 Furthermore, if a written request is lost in the mail or

delayed in its receipt by the merchant, the merchant might

be charged back prior to having the opportunity to respond.

In such cases, the merchant is made aware of such a

chargeback upon receiving a chargeback notification from the

merchant acquirer. Of course, this also impacts the

5 cardholder who might have to undergo a reverse of the

chargeback at some later time when the merchant produces

satisfactory documentation (e.g. a signed receipt) for the

transaction.

The burden imposed by inquiries, challenges and

10 chargebacks for transactions denominated in a currency other

than that of the card can subsequently lead to the

merchant's dissatisfaction with the merchant acquirer, as

well as the cardholder's dissatisfaction with the merchant.

Each card association/company monitors the volume of

15 chargebacks, in terms of their percentage of both the total

number of transactions and the total monetary amount of

those transactions for each merchant. If the percentage of

chargebacks exceeds the permissible limit set by the card

association/company, the merchant may incur additional

20 monetary penalties on a sliding scale as determined by the

card association/company. In addition, the merchant acquirer

might increase the merchant's discount rate and require an

additional security deposit to guarantee against future

chargebacks. In some cases of excess chargebacks, a

25 merchant might lose the ability to process further

transactions on the merchant account.

4

The current system also causes problems relating to card issuers and merchant acquirers. Upon receiving inquiries, challenges or chargeback requests on any transaction, both the card issuer and the merchant acquirer

5 require personnel to handle and monitor each request, typically via a manual process. Even if a simple inquiry does not result in a challenge or chargeback request, the card issuer still incurs a cost for responding to it. Each challenge or chargeback request often requires the card

10 issuer to generate a communication to the merchant acquirer who passes it on to the merchant that handled the transaction.

Card companies/associations are also burdened with the same process to resolve cardholder challenges and

15 chargebacks, as discussed above. Cards have a competitive disadvantage as opposed to payment by cash and checks, for which the exact price is known at the time of transaction.

Third-party card processors are also limited in their ability to offer outsourced point-of-sales services to

20 merchants beyond a particular geographical area, unless they choose to invest in costly hardware and software to enable direct communication with the merchants. With no such communication infrastructure in place, not only must the merchant make a long-distance phone call, but the merchant

25 often waits an unsatisfactory amount of time for the completion of the approval process, thus making the third-

party card processor's offering to merchant acquirers

residing outside of the third-party card processor's home

territory both costly and impractical.

Some of these problems are acknowledged in the prior

5 art. For example, U.K. Patent No. GB 2,319,381 discusses the

use of a dedicated system to perform currency conversions.

However, this patent fails to disclose a solution compatible

with the realities of existing business and finance

infrastructure or practice. A practical solution is thus

10 needed to remedy the problems associated with multi-currency

transactions as relating to cardholders, merchants, card

issuers and merchant acquirers, card companies/associations

and third part card processors.

There is a long felt need for a system and method able

15 to perform point-of-sale transactions in a plurality of

currencies to eliminate such price uncertainties and to

provide numerous other advantages associated with using

multiple-currency enabled transactions. The present

invention fulfills these needs.

20 SUMMARY OF THE INVENTION

It is an object of the present invention to address the

above-described deficiencies in the existing point-of-sale

systems. One object of the present invention is to provide a

point-of-sale terminal enabled to interact with a multi-

25 currency payment platform. As opposed to simply passing

standard point-of-sale transaction information, the point-of-

sale terminal in the present invention is enabled to

download, in real-time, current exchange rates from a

merchant acquirer or other financial/foreign exchange service

provider. In addition, the point-of-sale terminal is enabled

5 to recalculate the transaction from the local currency (or

other currency in which the merchant has priced the

transaction) and allows the cardholder/merchant to designate

in which currency the transaction will be processed (e.g. the

currency in which the card being used in the transaction is

10 denominated).

　　　　It is another object of the present invention to

facilitate a transaction in which a cardholder will see an

amount on the cardholder's periodic billing statement

corresponding to the exact amount that was processed at the

15 time of transaction in the currency of the cardholder's

choice and for which the cardholder received a bill or

receipt from the merchant. This will reduce the number of

inquiries, challenges and chargebacks on such transactions

that a cardholder transacts in a currency different from that

20 denominated by the card used and will enhance cardholder

satisfaction. In addition, the cardholder will not bear the

cost of exchange rate differentials and other costs

associated with the translation of currencies, other than

what the cardholder signed for, or otherwise assented to, at

25 the time of purchase.

It is another object of the present invention, and an
additional benefit, to enable cardholders to expedite the
reporting of their expenses based on actual transaction
amounts, instead of having to wait for transaction amounts to
5 appear on the periodic billing statement. For example, a
business person that is traveling abroad, for example, will
be able to receive receipts in the business person's currency
of choice, thus expediting his ability to reconcile and
submit his/her expense reports required for reimbursement.
10 In addition, a cardholder could also choose to pay in a
different currency (e.g. one other than that denominated by
the cardholder's card), based on other considerations, such
as favorable exchange rates in other currencies. The
cardholder could also choose a currency with the most
15 favorable exchange rate with respect to the currency of the
cardholder's creditor or bank so as to optimize the economics
of the purchase.

This will also reduce the number of inquiries,
challenges and chargebacks for such transactions. In turn,
20 this will increase the merchant's productivity or the
cardholder's satisfaction with the merchant, and will greatly
reduce the merchant's costs to respond to such inquiries,
challenges and chargebacks. The cardholder might be more
likely to spend in a foreign country since the cardholder
25 will have the comfort of being able to compare prices back
home in the same currency, thus benefiting the cardholder and

generating more business for the merchant from foreign

cardholders.

Embodiments of the current invention also enable third-

party card processors to expand their outsourced services to

5 merchant acquirers worldwide in a cost-effective, timely and

secured manner without an additional up front investment.

In some embodiments, the present invention provides a

system and method that include a multi-currency payment

platform which uses software to interface a point-of-sale

10 terminal with a voucher receiving module and a database

system so as to enable the point-of-sale terminal to download

current exchange rates for particular currencies. Thus, when

a cardholder wishes to know the value of the transaction in a.

particular currency, the point-of-sale terminal will be able

15 to provide the cardholder with the exact amount that will be

charged in that currency at the time of receipt of the

cardholder's statement for the card. The software gives the

point-of-sale terminal the capability to recalculate the

transaction amount from the currency in which the merchant

20 has priced the transaction (usually the local currency) into

the currency of the cardholder's choice, and allows a choice

to be made as to the currency in which the transaction will

be processed. In other words, not only will the cardholder

know the currency exchange rate and the exact purchase price,

25 but the entire transaction is processed in the cardholder's

currency of choice. In addition, the merchant will receive

settlement in the currency of his choice, which will not

necessarily be the merchant's local currency.

It is noted that although one of the parties involved in

transactions is referred to throughout this description as a

5 "merchant", this term is intended to apply to vendors of

things other than goods, such as vendors of services and the

like. The present invention thus relates to any type of non-

cash transaction having a transactor and transactee (*e.g.*

cardholder and merchant), including by way of example and

10 without limitation, sales, licenses, leases, services, etc.

The term "card" is used to encompass any device containing

information about a cardholder which is suitable for

completing a transaction between a cardholder and merchant

and includes but is not limited to credit cards, bank debit

15 cards, travel and entertainment cards, and "smart" cards,

which are equipped with magnetic strips or embedded

electronics, have memory and are capable of processing

information.

In one embodiment, the merchant presents the cardholder

20 with the cost of the transaction in the merchant's favored

currency and asks the cardholder whether he or she would

prefer to have the bill calculated in a different currency.

If the cardholder does choose another currency, the merchant

inputs a code into the point-of-sale terminal or selects a

25 symbol on the point-of-sale terminal, which corresponds to

the cardholder's choice. The software associated with the

point-of-sale terminal then uses the current exchange rate

(*e.g.*, the up-to-date exchange rate most recently downloaded

to the point-of-sale terminal) between the local currency and

the cardholder's currency of choice, and calculates the

5 amount of the transaction in the cardholder's currency of

choice. When the cardholder opts to initiate payment for the

transaction, the cardholder's card is swiped through the

point-of-sale terminal.

The transaction is processed using the selected

10 currency. Such processing involves routing the transaction

to a point-of-sale transaction system, where the transaction

is logged in, and the appropriate communications between a

voucher receiving module, a database system, if indicated,

and a local or multi-currency processor are made such that

15 authorization from the card issuer is requested. Examples of

voucher receiving modules include delegated modules (such as

a geographical module) and acquirer modules. The point-of-

sale transaction system tracks the required currency to be

settled for the merchant and to be paid by the cardholder.

20 The cardholder is provided with a receipt for the amount of

the transaction in the currency that has been chosen.

Ultimately, the merchant is paid for the transaction in the

currency of the merchant's choice. One feature of the point-

of-sale transaction system is a profile for each merchant

25 which, among other things, identifies the merchant's chosen

or default currency in which the merchant wants the

transactions settled with the merchant's acquirer.

In another embodiment, the invention can optionally be

used for local currency point-of-sale transactions as well.

5 That is, the point-of-sale terminal, while giving the

cardholder the option of selecting among multiple

currencies, does not require the cardholder to exercise this

option, such that the transaction can be completed in a

default currency of the point-of sale terminal, which most

10 likely will be a local currency.

In another embodiment, the point-of-sale equipment is

equipped with an Internet connection, and can be used to

perform transactions as described herein by communicating

over the corresponding medium.

15   In some embodiments of the present invention, at least

one point-of-sale terminal is connected in a network to one

or more voucher receiving modules which are in communication

with at least one database system and which each might be in

communication with a local processor. Each database system

20 is in communication with at least one multi-currency

processor. Both local processors and multi-currency

processors are affiliated with acquirers, and are in

communication with an automated clearing house that obtains

authorization from the issuer of a cardholder's card, such

25 as a credit card or a debit card or the like.

In some embodiments of the invention, a router is used

to screen, for example and without limitation, users of the

point-of-sale terminals and any merchant web sites

communicating with the point-of-sale transaction system to

5 ensure that each is authorized to access the point-of-sale

transaction system. The router interfaces between the

point-of-sale terminals and the voucher receiving module

directly when the point-of-sale terminals are not Internet-

enabled, or between modules, the Internet, and the point-of-

10 sale terminals and any merchant web sites when the point-of-

sale terminals are Internet-enabled, for example. In a

given point-of-sale transaction system according to the

invention, both non-Internet-enabled and Internet-enabled

point-of-sale terminals can be accommodated through the use

15 of dedicated routers, e.g., the two above-discussed

embodiments can effectively be combined.

The system and method according to the present invention

may further include features provided to optimize the

security and reliability of transaction data transfer among

20 the various components and to carefully limit access to those

who have authorization to data about particular cardholder-

merchant transactions.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated in the figures of the

25 accompanying drawings which are meant to be exemplary and not

limiting, in which like references are intended to refer to

like or corresponding parts, and in which:

Fig. 1a is a diagram of a point-of-sale device

displaying a value in a local currency, in accordance

5   with an embodiment of the present invention;

Fig. 1b is a diagram of a point-of-sale device

displaying a value in a local currency and a value in a

cardholder currency, in accordance with an embodiment of

the present invention;

10   Fig. 1c is a diagram of a point-of-sale device of

an embodiment of the present information where

cardholder information is inputted into a card reader;

Fig. 1d is a diagram of a point-of-sale device of

an embodiment of the present invention where a printer

15   prints a receipt for the value in the cardholder-

specified currency;

Fig. 2a is a flow diagram showing an authorization

process of an embodiment of the present invention;

Fig. 2b is a flow diagram showing an authorization

20   process of another embodiment of the present invention;

Fig. 2c is a flow diagram showing a further

embpodiment of an authorization process of the present

invention;

Fig. 2d is a flow diagram showing a voucher

25   transaction and payment process of an embodiment of the

present invention;

14

Fig. 3 is a multi-system topology of one embodiment

of the present invention;

Fig. 4a is a block diagram of the routing of a

transaction in accordance with an embodiment of the

5   present invention;

Fig. 4b is a block diagram of the routing of a

transaction in accordance with another embodiment of the

present invention;

Fig. 4c is a block diagram of the routing of a

10   transaction in accordance with another embodiment of the

present invention;

Fig. 5a is a flowchart illustrating a local

currency transaction in accordance with an

embodiment of the present invention;

15   Fig. 5b is a flowchart illustrating a multi-

currency transaction in accordance with an

embodiment of the present invention;

Fig. 5c is a flowchart illustrating a local

currency authorization process in accordance with an

20   embodiment of the present invention utilizing HTTPS

form;

Fig. 5d is a flowchart illustrating a multi-

currency authorization process in accordance with an

embodiment of the present invention utilizing HTTPS

25   form; and

Fig. 6 is a block diagram showing a voucher

receiving module configuration in accordance with an

embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5   A system and method according to the present invention

works with several components. With reference to Figures 1a

– 1d, such components include, in one embodiment, at least

one merchant point-of-sale terminal 100, equipped with a

display 102, a card reader 104, means to input purchaser or

10 merchant selections or instructions such as a keypad 106, for

example, and preferably a printer 108 for providing a receipt

and a connection port (not shown), such as by way of example

and without limitation a telephone dial-up line, for

connecting the point-of-sale terminal to a module site. In

15 addition, a point-of-sale terminal 100 in accordance with

embodiments of the invention may be a general purpose

computer programmed to perform the functions described herein

for the terminal, for use, for example, when a purchase is

being made over the Internet.

20   Figure 1a shows display 102 displaying a value of a

purchase to be made in a first currency, the merchant's local

currency for example, in accordance with an embodiment of the

present invention. In the present example, the first or

merchant currency has been arbitrarily chosen by way of

25 example to be New Israeli Shekels ("NIS"). The keypad 106 or

other suitable input device is then used to enter a code

corresponding to a second currency, such currency chosen by

the cardholder, issuer of the card, or other. Figure 1b

shows display 102 displaying both the value of the purchase

in the first currency and its value in a second currency, the

5 cardholder's currency for example, in accordance with an

embodiment of the present invention. In the present example,

the second or cardholder currency has been arbitrarily chosen

by way of example to be Swiss Francs ("CHF"). The value of

the first currency and the value of the second currency in

10 accordance with the present invention have an exchange-rate

relationship. In Figure 1c, cardholder information is

inputted into a card reader 104 in accordance with an

embodiment of the present invention. Figure 1d shows an

embodiment of the present invention where the printer 108

15 prints a receipt for the value in the second currency.

Referring to Figure 2a, the transaction process for

locally processed currency is accompanied by circled numbers

indicating the sequence of the transaction flow. The

sequence numbers in this and the other drawings represent

20 sequences of events in the particular drawing only; there is

no relation among the sequence numbers across drawings. A

cardholder 202 first pays a merchant 204 using a credit card

or other non-cash payment mechanism. The cardholder 202 and

merchant 204 are also sometimes referred to herein as

25 transactor and transactee to a transaction. While one

embodiment requires the cardholder 202 to physically present

a card upon transacting, alternate embodiments of this

invention do not require the cardholder 202 to have actual or

constructive possession of a card. To clarify, a cardholder

202 in the broadest sense of its intended meaning herein is

5 an account holder, where such account is for credit, debit,

charge, gratis, etc. As discussed further below, some

embodiments of the present invention are initiated from the

Internet, and some embodiments of such, for example, only

require evidence of an account, such as an account number or

10 other appropriate indicia of financial means.

The merchant 204 then forwards vouchers to a module site

206. A module site 206 is referred to herein as a voucher

receiving module 206 as it is not a requirement that the

components of which the module site comprise all be in one

15 place; is some embodiments, they are distributed. The terms

"module site" and "voucher receiving module" encompass

various system components which are used to process and store

data regarding particular transactions and to protect the

security of the transaction data and limit unauthorized

20 access to the module site. Each merchant's transaction

enabled point-of-sale terminal 100 is configured to connect

to a specific voucher receiving module 206, to which the

point-of-sale terminal automatically sends all card

transactions that require authorization. The voucher

25 receiving module 206 handles the routing of each

authorization request to a card processor system 212 and logs

each of the transactions and its authorization status in a

database server 302 (see Figure 6) whose reports are

accessible to the merchant 204. The various system

components of a voucher receiving module 206 will be

5 discussed further below.

In some embodiments of the present invention, point-of-

sale terminals 100 are Internet-enabled (*e.g.* the point-of-

sale terminal 100 has a port through which an Internet

connection can be established). If point-of-sale terminals

10 100 are Internet-enabled point-of-sale terminals 100a (see

Figure 3), the system and method allows data about particular

transactions to be communicated with a voucher receiving

module 206 via a web site affiliated with the merchant. The

merchant web site may or may not be enabled for e-commerce

15 transactions.

Voucher receiving modules 206 as used in connection with

the present invention are of at least two types. For

example, one type of voucher receiving module 206 is referred

to herein as an acquirer module site or an acquirer module

20 210 and is associated with and usually physically located at

a particular acquirer. An acquirer module 210 typically is

affiliated with a processing system 212 that is associated

with the acquirer where the module site is located, e.g.

within the same country or region. The processing system 212

25 that is associated with the acquirer where the module site is

located comprises a local processor 214.

An "acquirer" is an entity that has a business relationship with merchants 204 whereby the acquirer acquires vouchers from the merchants' sales for purchases in which a card is used (a credit card, bank debit card, etc.) and then

5   seeks payment from the issuer of the card. In other words, an acquirer pays the merchant for the vouchers, usually at some discounted rate so as to permit the acquirer to profit from the transaction. Acquirers are business entities, typically banks or other financial institutions, that make

10 arrangements with merchants 204 so as to enable the merchants 204 to accept card payments. An acquirer purchases ("acquires") the card vouchers collected by a merchant 204 (typically electronic vouchers) at a discount and receives payment from the card issuer 224, typically through a

15 clearinghouse 220. In one embodiment, an acquirer module 210 is located on the physical premises of an acquirer, and services the card transactions of the acquirer's merchants. Each acquirer module 210 preferably has a direct high-speed secured connection to the acquirer's local processor 214.

20   Referring again to Figure 2a, the voucher receiving module 206 at the acquirer authorizes payment to the merchant 204 after it receives the voucher. The acquirer deals with the bank that issued the purchaser's card through a local processor 214 and usually through a clearinghouse 220, in

25 order to obtain authorization for payment for the purchaser's transactions with the merchant 204. The issuer 224 receives

electronic vouchers forwarded from the voucher receiving

module 206, to the local processor 214, and from the

clearinghouse 220. In an analogous procedure, the issuer 224

sends "back" payment authorization through the clearinghouse

5 220 and ultimately to the voucher receiving module 206. This

drawing, as in Figs. 2b and 2c, deals with authorization

vouchers rather than payment itself. As exaplined further

below, Figure 2d shows the payment process, in which the

local processor 214 gets bypassed when payment travels back

10 to the voucher receiving module 206, although such bypass is

not necessary. In any event, the issuer 224 eventually bills

the cardholder 202 to collect payment.

In one embodiment, the local processor 214 processes one

type of currency, however in alternate embodiments the local

15 processor can process multiple currencies. Such is the case,

for example, when there are more than one type of currencies

associated with the geographic or national location of the

merchant 204.

Figure 2a shows one embodiment of the authorization

20 process that accompanies, for example, the embodiment of the

locally processed transaction. Subsequent to the cardholder

202 swiping the cardholder's card (or otherwise submitting a

code for payment, such as over the Internet), an

authorization request for the transaction proceeds

25 sequentially from the merchant 204 to the voucher receiving

module 206 to the local processor 214, through the

clearinghouse 220, and to the issuer 224. If the

authorization request is approved by the issuer 224, an

authorization confirmation is sent upstream in reverse

fashion until authorization confirmation ultimately reaches

5 the merchant 204.

Another type of voucher receiving module 206 is

sometimes referred to as a geographical module site and is

referenced herein as a delegated module 216 (see, for

example, Fig. 5b). This type of voucher receiving module 206

10 interfaces between multiple acquirers and their merchants 204

that are usually in a particular geographical territory. To

clarify, however, the delegated module 216 is not limited to

interfacing with acquirers or merchants 204 whom are in

proximate geographic location to each other.

15   A delegated module 216, which is not located at an

acquirer's physical premises in some embodiments, services

the card transactions of merchants 204 associated with an

acquirer which does not have an affiliation with a local

processor 214, but rather has an affiliation with a processor

20 outside of the merchants' general locale. In one embodiment,

a delegated module 216 is not directly connected to a local

processor 214. A delegated module 216 in accordance with the

present invention is in communication with a multi-currency

processing system 212, comprising, as shown for example in

25 Fig. 2b, a database system 222, which is in communication

with a multi-currency processor 218. Thus, in some

embodiments, even if a cardholder 202 elects to process a
transaction in a merchant's local currency, the transaction
will be processed through a database system 222 and a multi-
currency processor 218.

5   The delegated module 216 is associated with a processing
system 212, comprising a multi-currency processor 218 and a
database system 222. Database system 222 is sometimes
referred to as a database center, however a fully centralized
database facility is not required. Database system 222 may

10 comprise a centralized database or database center, however
it may also comprise a distributed database. The multi-
currency processor 218 communicates with the database system
222 and is usually located outside of the locale of the
merchants 204 or acquirers that the delegated module 216

15 services. In one embodiment, the multi-currency processor
218 is capable of both multi-currency and single-currency
transaction processing.

        In one embodiment, as shown in Fig. 2b, the database
system 222 is interfaced between a voucher receiving module

20 206 and a multi-currency processor 218. The database system
222 is employed whenever a cardholder 202 wishes a
transaction to be processed in a currency other than the
currency "chosen" by the merchant 204. The merchant's chosen
currency is usually the default currency of the point-of-sale

25 terminal 100, however in some embodiments the merchant 204
can specify the currency in which the merchant 204 will be

                                23

paid. In some embodiments, the multi-currency processing

system (comprising at least the multi-currency processor 218

and the database system 222) works with a delegated module

216, however other embodiments will be further discussed

5 below, such as when an acquire module 210 is temporarily non-

communicative, for example.

Referring still to Figure 2b, the authorization process

for a multi-currency transaction begins when the cardholder

202 swipes the cardholder's card. Note that the circled

10 numbers are used to indicate the sequence of flow. An

authorization request proceeds from the merchant 204 to the

voucher receiving module 206, to the database system 222,

through the multi-currency processor 218, and then to the

issuer 224 via a clearinghouse 220. If the authorization

15 request is approved by the issuer 224, an authorization

confirmation travels in reverse fashion until authorization

confirmation ultimately reaches the merchant 204. In the

embodiment shown, the voucher receiving module 206 comprises

an acquirer module 210. In another embodiment, however, the

20 voucher receiving module comprises a delegated module 216.

Referring to Figure 2c, the multi-currency transaction

process begins when the cardholder 202 swipes the

cardholder's card. Vouchers in the foreign currency (e.g.,

selected by the cardholder 202) are forwarded from the

25 merchant 202 to a voucher receiving module 206 associated

with an acquirer(s). The acquirer then settles redemption of

24

the voucher by making payment of the voucher in the

merchant's currency of choice to the merchant 202. The

foreign currency voucher is then forwarded by the voucher

receiving module 206 through the multi-currency processor 218

5 and to the issuer 224 via a clearinghouse 220. If

authorization for the transaction was approved, then the

issuer 224 subsequently sends an authorization voucher in the

foreign currency to the multi-currency processor 218 via the

clearinghouse 220.

10   It is thus appreciated that embodiments of the present

invention differentiate between local processors 214 and

multi-currency processors 218. Local processors 214

typically handle card transactions in one or two locally

processed currencies (e.g. as offered by the acquirer as per

15 the capabilities of the local processor 214), whereas multi-

currency processors 218 service their cardholders 202 by

offering a greater selection of international currencies.

Furthermore, the multi-currency payment platform determines

what type of transaction is present and directs transactions

20 and authorizations accordingly.

In a typical local currency transaction, the cardholder

202 or the merchant 204 swipes the purchaser's card through

the card reader 104 of a merchant's point-of-sale terminal

100 to initiate the transaction. Usually, the point-of-sale

25 terminal 100 has a default currency which corresponds to the

currency commonly used in the country in which the merchant

is located (e.g. U.S. dollars in the United States). If the

cardholder 202 is content to have his or her transaction

processed in the default or "local" currency specified by the

merchant 204, the cardholder's action in swiping the card

5 will result in at least the following:

The point-of-sale terminal 100 will communicate with the

voucher receiving module 206 of the merchant's acquirer,

which comprises an acquirer module 210 or comprises a

delegated module 216, and the cardholder's 202 card

10 information will be transferred, in a secure manner, the

system confirming, via a router in the voucher receiving

module 206, for example, that the point-of-sale terminal 100

is enabled to access the point-of-sale transaction system.

If authorized access by the merchant's point-of-sale terminal

15 100 is confirmed, the voucher receiving module 206 logs the

appropriate information regarding the transaction into a

database server 302 (see Figure 6) of the voucher receiving

module 206 and begins to process the transaction to obtain

approval for it from the purchaser's card issuer 224.

20   If the voucher receiving module 206 is affiliated with a

local processor 214, such as for example in the case of an

acquirer module 210, the voucher receiving module 206 will

attempt to communicate information about the transaction

derived from the cardholder's card and the merchant's point-

25 of-sale terminal 100 to the local processor 214, which

typically is in communication with the issuer 224 of the

purchaser's card via a card clearinghouse 220 or the like.
If the local processor 214 is communicative (*e.g.* on-line) at
the time the voucher receiving module's communication is
attempted, the local processor 214 will accept the

5 transaction data from the acquirer module 210, for example
and initiate the appropriate protocol to obtain authorization
for the transaction from the cardholder's card issuer 224.

If the local processor obtains authorization from the
card issuer 224, the local processor 214 communicates the

10 authorization to the acquirer module 210, whereas the
database server 302 of the module site records the
authorization, and then the module site communicates the
authorization to the merchant's point-of-sale terminal 100
and the transaction, as between the cardholder 202 and the

15 merchant 204 is completed. The point-of-sale terminal 100,
if configured with a printer 108, then can provide the
cardholder 202 or the merchant 204 with a receipt.

In a "multi-currency" transaction, at the time of
purchase, the cardholder 202 opts to select a currency other

20 than the point-of-sale terminal's default currency (*e.g.*
usually the merchant's local currency) in which to process to
the transaction. Before swiping the card through the card
reader 104 at the point-of-sale terminal 100, the purchaser
opts to take advantage of the means provided in the point-of-

25 sale terminal 100 to select a currency of his or her choice
in which the transaction will be processed. Such means may

be by keypad 106 or by any other suitable means. In some

situations, the cardholder 202 might review a plurality of

currency choice options provided on the display 102 of the

merchant's point-of-sale terminal 100, and the purchaser

5 would select from among these options, which would prompt the

point-of-sale terminal software to communicate with the

voucher receiving module 206, preferably the delegated module

216, to obtain the current exchange rate between the

merchant's desired currency and the local currency and in

10 some embodiments the exchange rate between the merchant's

desired currency and the cardholder's desired currency.

Alternatively, if for some reason the voucher receiving

module 206, such as the delegated module 216, was non-

communicative at the time, the point-of-sale terminal 100

15 would communicate directly with a database system 222, and

the database server 302 of the module site would be updated

later by the database system 222 with the details of the

transaction. If the voucher receiving module 206, which is

the delegated module 216 in one embodiment, is active at the

20 time of the transaction, the relevant information about the

transaction is logged in and the delegated module 216

communicates with the database system 222 which, in turn,

interfaces with a multi-currency processor 218 to process the

transaction in the cardholder's chosen currency. The multi-

25 currency processor 218 will interface with the card issuer

224, through a clearinghouse 220 or bank or directly, to seek

28

authorization to complete the transaction. Assuming that

authorization is obtained, information identifying the amount

of the transaction in the desired currency will be conveyed

to the cardholder 202 via the display 102 or a printed

5 receipt via printer 108. An electronic receipt is provided

in some embodiments and is further discussed below.

A process of receiving payments on authorized charges is

shown in Fig. 2d. The merchant 204 submits (such as at day's

end) authorized vouchers to the acquirer 206, which forwards

10 the voucher(s) to the issuer 224 through, in this embodiment,

the local or multi-currency processor and clearinghouse 220.

The issuer 224 makes payment through the clearinghouse 220,

which sends the payment to the acquirer 206, which then

forwards the payment on to the merchant 204 or the merchant's

15 bank. In accordance with aspects of the invention, payment

is made in the currency chosen by the merchant.

Referring to Figure 3, there is shown a topology of the

system according to the present invention in which it is

clear that various combinations of the components of the

20 point-of-sale transaction system can be organized so as to

provide interaction between cardholders 202, merchants 204,

and multi-currency processors 218, and card issuers 224 in a

variety of ways. Various sub-topologies are also depicted in

Figures 4a – 4c for the purpose of example and without

25 limitation. Note that transactions can be initiated by a

non-Internet-enabled point-of-sale terminal 100 or an

Internet-enabled point-of-sale terminal 100a with HTTPS form

226 for example. It is contemplated that transactions also

might be initiated without the use of point-of-sale terminal

but rather via a merchant's e-commerce enabled web site with

5 HTTPS form 226.

The voucher receiving modules 206 involved may be

dedicated acquirer modules 210 which communicate with both a

local processor 214 and, as indicated in some embodiments,

with a database system 222 and multi-currency processor 218.

10 Alternatively, the voucher receiving modules 206 may be

delegated modules 216, which communicate with a database

system 222 and a multi-currency processor 218 regardless of

whether a transaction is to be completed in the local

currency or in a different currency. Multiple database

15 systems 222 may be securely interconnected to enhance system

capacity and to promote system efficiency. In some

embodiments, the multiple database systems 222 may comprise a

distributed database either alone or in combination.

In some embodiments, a voucher receiving modules 206, at

20 least including delegated modules and acquirer modules 210,

communicate with all database systems 222 via a virtual

private network ("VPN"), thus enabling transactions to be

routed from any voucher receiving module 206 to any multi-

currency processor 218 that is connected to a database system

25 222. Also in some embodiments, each database system 222 is

located at a highly secured location, providing a direct,

30

high-speed, secured connection to at least one multi-currency

processor 218. Each database system 222 is accessible from

all of the voucher receiving modules 206, thus enabling any

multi-currency processor 218 to process card transactions for

5 any point-of-sale terminal 100. In a system topology

comprising multiple database systems 222, all database

systems 222 are connected via high-speed, secured, leased

lines.

The database system 222 has a secured, high-speed frame-

10 relay connection directly to at least one multi-currency

processor 218, which can process transactions in a selection

of international currencies. In some embodiments, each

database system 222 is located at a highly secured location

and is connected to one multi-currency processor 218, through

15 a frame-relay connection that is backed-up. A database

system 222 is adapted to handle the processing of card

transactions for any acquirer's merchants 204 (e.g. merchants

who use point-of-sale terminals 100 and whose acquirer works

with the point-of-sale transaction system). Any voucher

20 receiving module 206 can re-direct its transactions to a

database system 222, which will handle the processing of the

transactions with a multi-currency processor 218. However,

for optimal performance system-wide, the point-of-sale

transaction system is configured to automatically route

25 transactions from a specific set of module sites to a

specific database system. After handling a transaction (e.g.

31

via a multi-currency processor 218), the database system 222

sends the transaction status information to the merchant's

owner module site (*e.g.*, the module site to which the

merchant's point-of-sale terminal automatically

5 communicates).

Each database system maintains a database 222 that

stores information on all card transactions that are handled

system-wide (*e.g.*, for the merchants of all acquirers) even

for transactions processed by a local processor 214 directly

10 connected to a voucher receiving module 206. In real-time,

the database 222 stores all information on transactions that

a voucher receiving module 206 has directed to it (*e.g.*,

transactions handled by a multi-currency processor). On a

regularly scheduled basis, each voucher receiving module 206

15 sends the database 222 the aggregate information on those

transactions handled by its acquirer's local processor 214

(*e.g.* transactions not routed through any database system).

In one system topology, with multiple database systems

222, if one database system 222 or its multi-currency

20 processor 218 is unavailable, then its transactions can be

routed to another database system 222. In some embodiments,

all database systems 222 are connected via high-speed,

secured leased lines, through which they can continually

synchronize their database systems 222. Since the same

25 transaction information is replicated across all database

systems 222, a system-wide management report can be generated

from any database system 222.

Each point-of-sale terminal 100 stores currency symbols

together with each currency's current exchange rate in

5 relation to the merchant's local currency (e.g., the default

currency offered by the merchant 104). In one embodiment,

each merchant's point-of-sale terminal 100 downloads the

current exchange rates that it requires (e.g., according to

the currencies defined in the merchant's profile in the

10 point-of-sale terminal 100) from its voucher receiving module

site 206. The download can be accomplished periodically

according to a defined schedule (e.g. every 6 hours) or in

real time (e.g. whenever an exchange rate is updated).

In some embodiments, a merchant profile contains

15 merchant parameters required for processing transactions,

including in various combination, currencies, discount rates,

holdback percentages, holdback period, fees and payment

period. The merchant profile defines which currencies are

locally processed, as well as the settlement currency that is

20 associated with each type of multi-currency available. Local

currency transactions are settled in the merchant's local

currency. However, for multi-currency transactions, the

merchant 204 can specify an alternative currency that might

be preferable over the local currency. For example, if a

25 merchant's local currency is Italian Lire, yet the merchant

204 views the Japanese Yen as the preferred currency to be

settled when the cardholder 202 chooses to pay in Japanese

Yen or in any other non-local currency.

In accordance with the present invention, each voucher

receiving module 206 handles the logging and routing of card

5   transactions for a specific set of merchants 204. Referring

to the embodiment of Figure 5a, an acquirer module 210, which

may be located at an acquirer's physical premises, services

the transactions for that acquirer's merchants 204. An

acquirer module 210 has a secured, high-speed frame-relay

10 connection directly to the acquirer's local processor 214.

In this embodiment, the cardholder 202 inputs card details

into the point-of-sale terminal 100 and transaction

information is sent to an acquirer module 210 and the local

processor 214. Authorization information and transaction

15 vouchers are obtained in accordance with that generally

described above, preferably as described in conjunction with

Figures 2a – 2d, and are forwarded to the point-of-sale

terminal 100 via the acquirer module 210 and transaction

reports are communicated, preferably via e-mail, to the

20 merchant administrator 402 who may or may not be physically

located at the merchant 204 or the voucher receiving module

administrator 400 who may or not be physically located at the

acquirer module 210.

Referring to the embodiment of Figure 5b, a delegated

25 module 216 services the merchants 204 of any number of

acquirers in a geographical territory, for example. In this

34

embodiment, the cardholder 202 inputs card details into the

point-of-sale terminal 100 and transaction information is

sent to an delegated module 216 and the processing system

212, first going to a database system 222 and then a multi-

5 currency processor 218. Authorization information and

transaction vouchers are obtained in accordance with that

generally described above, preferably as described in

conjunction with Figures 2a - 2d, and forwarded to the point-

of-sale terminal 100 via the database system 222 and

10 delegated module 216 and transaction reports are

communicated, preferably via e-mail, from the database system

222 to the merchant administrator 402 who may or may not be

physically located at the merchant 204 or the voucher

receiving module administrator 400 who may or not be

15 physically located at the delegated module 216.

Referring to the embodiment of Figure 5c, an acquirer

module 210, which may be located at an acquirer's physical

premises, services transactions for that acquirer's merchant

HTTPS form 226. Cardholder 202 initiates a transaction

20 relating to HTTPS form 226 either with an Internet-enabled

point-of-sale terminal 100a or at a web site. The acquirer

module 210 has a secured, high-speed frame-relay connection

directly to the acquirer's local processor 214. In this

embodiment, the cardholder 202 inputs card details into the

25 Internet-enabled point-of-sale terminal 100a to http or

through a web site to http 226 and transaction information is

sent to an acquirer module 210 and the local processor 214.

Authorization information and transaction vouchers are

obtained in accordance with that generally described above,

preferably as described in conjunction with Figures 2a – 2d,

5 and forwarded to HTTPS form 226 via the acquirer module 210

and transaction reports are communicated, preferably via e-

mail, to the merchant administrator 402 who may or may not be

physically located at the merchant 204 or the voucher

receiving module administrator 400 who may or not be

10 physically located at the acquirer module 210 or the

cardholder 202 for Internet-initiated transactions which

utilized HTTPS form 226.

        Referring to the embodiment of Figure 5d, a delegated

module 216 services the merchants 204 associated with HTTPS

15 form 226, for example. In this embodiment, the cardholder

202 inputs card details into one of an Internet-enabled

point-of-sale terminal 100a that connects to HTTPS form 226

or an Internet site-related HTTPS form 226. Transaction

information is sent to an delegated module 216 and the

20 processing system 212, first going to a database system 222

and then a multi-currency processor 218. Authorization

information is obtained in accordance with that generally

described above, preferably as described in conjunction with

Figures 2a – 2d, and forwarded to HTTPS form 226 via the

25 database system 222 and delegated module 216 and transaction

reports are communicated, preferably via e-mail, from the

database system 222 to the merchant administrator 402 who may

or may not be physically located at the merchant 204 or the

voucher receiving module administrator 400 who may or not be

physically located at the delegated module 216 or the

5 cardholder 202 for Internet-initiated transactions which

utilized HTTPS form 226.

Each merchant's point-of-sale terminal automatically

sends the module site all card transactions that require

real-time authorization. The module to which the

10 merchant's point-of-sale terminal directs its transactions,

is referred to as the "owner module" as it stores (*e.g.,*

"owns") all information for all of the merchant's

transactions handled throughout the point-of-sale

transaction system, *e.g.,* regardless of what type of

15 processor (e.g., local or multi-currency) handles the

transaction.

Referring to Figure 6, each voucher receiving module 206

maintains a unique database server 302 which logs the details

and authorization status for card transactions. The database

20 server 302 stores information on all transactions handled by

the merchants 204 that it services, regardless of whether the

transactions are routed to a local processor 214 (*e.g.* that

is directly connected to the acquirer module 210) or to a

multi-currency processor 218 (*e.g.* that is directly connected

25 to a database system 222).

37

An acquirer module site typically routes authorization
requests for transactions denominated in locally processed
currency(ies) to the local processor 212, to which it is
directly connected. In some embodiments, the delegated
5 module 216 routes all authorization requests to a database
system 222, which communicates with a multi-currency
processor 218. A transaction may be completed in local
currency even via a database system 222 and multi-currency
processor 218, such as in the case where an acquirer module
10 210 is temporarily non-communicative (e.g., off-line). If a
multi-currency processor 218 does handle a transaction, the
database system 222 to which the multi-currency processor 218
is connected automatically sends the authorization status to
the voucher receiving module 206 for logging into the
15 module's database server 302. The voucher receiving module
206 is also used to generate the merchant's management
reports and statements. Again, as stated above, each
acquirer module 210 and delegated module 216 site can
communicate via a VPN with all database systems 222, which
20 are each connected to one or more multi-currency processors
218. The VPN provides an extra security layer through access
control, encryption and extensive firewalls.

It will be appreciated that since a point-of-sale
transaction download program can reside on the point-of-sale
25 terminal 100 or on the voucher receiving module 206 database
server 302, the download process can be initiated by either

an administrator 400 associated with a voucher receiving

module 206 or a merchant administrator 402. In embodiments

where the merchant 204 or merchant administrator 402

initiates the download process, the merchant's digital

5· signature is requested for authentication.

At least one of the database systems 222 periodically

(e.g. on a scheduled basis) receives the current exchange

rates, which are preferably supplied by an acquirer either

via a live link or a file upload. This database system 222

10 refreshes the exchange rate table stored in its server (not

shown). In turn, this database system 222 sends the current

exchange rates to all other database systems 222, for

updating the exchange rates table stored in each of their

respective servers. Each database system 222 sends the

15 current exchange rates to its associated voucher receiving

modules 206 for updating the exchange rates table stored on

each of their respective database servers 302 (see Figure 6).

The database systems' 222 database servers (not shown) and

the voucher receiving modules' 206 database servers 302

20 typically do not store historical exchange rates. However,

for each transaction, the voucher receiving module's 206

database server 302 logs the cardholder's 204 choice of

currency, the exchange rate, and the price in the chosen

converted currency (e.g. as selected by the cardholder 202)

25 and in the local currency (e.g. as specified by the merchant

204).

The particular components which might be used in a point-of-sale transaction method and system according to the invention may vary. One skilled in the art will recognize the interchangeability of discussed components with others

5 known in the art.

Again referring to Figure 6, the voucher receiving module 206 preferably includes a router 306, a firewall server 308, a registration authorization server 310 herein also referred to as an RAS router 310, database server 302,

10 card processor gateway 304, a web server 312, and a mail server 314. The card processor 304, router 306, mail server 310, web server 312, and database server 302 are each preferably equipped with firewall options. Router 306 comprises for example and without limitation a Cisco router.

15 These components may each run on separate machines or the same machines.

By way of example and without limitation, the following commercially available components might be installed database systems 222: a backup system, Hot backup for Oracle, local

20 network equipment, Catalyst, routers (including software), spare drives and memory, UPS, secure computer shelf, firewall machine (e.g. Sun systems), encryption hardware, Windows 2000 advanced server, or a paging system.

In some embodiments, and by way of example and without

25 limitation, the following software components might also be installed at the database system 222: anti-virus, Login

system, Checkpoint firewall, Linux, Oracle 8I, Windows 2000

advanced server, MSDN library, Oracle library, IP sentry,

Paging system, On-line alarm BIOS system, or WAP IL.

By way of example and without limitation, the following

5 commercially available components might be installed at

point-of-sale voucher receiving modules 206: backup servers,

logic system, or Oracle 8I. A database for logging the

transaction details and determining the currency options is

configured and designed based on the Oracle database sold by

10 the Oracle Corporation. Oracle databases are kept

synchronized by means of inter-site replication.

By way of example and without limitation, the router 306

includes a firewall option, such as a router available from

the company Cisco or some other commercially available

15 router. Router 306 is installed at each voucher receiving

module 206 and, in some embodiments, the database system 222

also contains a router (not shown). In addition to providing

powerful routing functions, the router 306, via its firewall

option, provides the level of firewall support throughout the

20 point-of-sale transaction system, so as to protect the entire

point-of-sale transaction system from unauthorized access and

tampering via the Internet. It will be appreciated, however,

that any suitable router may be used.

A firewall server 308 is installed at each voucher

25 receiving module 206 and, in some embodiments, the database

system 222 also contains a firewall server (not shown). The

41

firewall server 308, which works in conjunction with the

router 306 with the firewall option, for example, provides a

second level of firewall support throughout the point of-sale

transaction system. The firewall server 308 stores an access

5 control list ("ACL") which describes the protocols, IP ports

and IP addresses that are currently opened for appropriate

respondents.

In one embodiment, the firewall server 308 requires the

following minimum hardware platform: Intel processor PII-200

10 or higher PCI architecture, 64 MB RAM, 2 GB hard disk, 100 MB

network card, Linux 6.2 and standard "ipchains" daemon

supplied with Linux for IP firewalling chains.

In some embodiments, the RAS router 310, which has a

multi-port connection device, enables a merchant's point-of-

15 sale terminal to dial-in to a specific connection via an

authorized user name and password. The RAS Router 310 also

provides for an Internet connection and guarantees secured

access, via authentication services that limit access to the

point-of-sale transaction system. In one embodiment, a

20 router 306 that is based on Cisco's IOS operating system and

that supports IP sec protocols is used.

In some embodiments, a mail server 314 used in

accordance with the present invention, automatically e-mails

a status report to each e-commerce client that performs a

25 card transaction utilizing the point-of-sale transaction

system. A default status report (e.g. that is automatically

e-mailed) can be used, which can be modified by e-merchants,

as required. In some embodiments, the mail server 314 has an

alarm mail system that is automatically activated in the

event of a network failure, power outage or other emergency

5 situation.

In some embodiments, the mail server 314 requires the

following minimum hardware platform: Intel processor PII-200

or higher, PCI architecture, 64 MB RAM, 4 GB hard disk and a

100 MB network card. It may also utilize the following

10 software platform: Linux 6.2, "Qmail" service with options

for prevention of relay-connections from unauthorized

personnel and for protection against spam-relaying, and

standard "ipchains" daemon-supplied with Linux for IP

firewalling chains.

15   The web server 312 enables e-merchants to perform

transactions via HTTPS 226 and is also accessible for

merchants 204, merchant administrators 402, and voucher

receiving module administrators 400 to view administration

reports. The routing logic is also handled by the web server

20 312. The web server 312 used in some embodiments requires

the following minimum hardware platform: Intel processor

PIII-700 or higher, PCI architecture, 356 MB RAM, 9 GB WIDE-

SCSI hard disk with mirroring, 100 MB network card.

Embodiments of the web server 312 utilize the following

25 software platform: Linux 6.2, Apache web server with a

VERISIGN-certified HTTPS connection, Oracle 8.1.5 or 8.1.7

database, and standard "ipchains" daemon-supplied with Linux

for IP firewalling chains.

The database server 302 stores transaction data,

merchant profile data, and all global system parameters. The

5 database server 302 at a voucher receiving module 206 stores

transaction data for the merchants 204 serviced by the module

site, whereas the database server at a database system (not

shown) stores aggregate data on transactions for all

merchants 204 serviced by any voucher receiving module 206.

10 An embodiment of the database server 302 in accordance with

the present invention is based upon the following hardware

platform:

Intel platform and safe wide-SCSI mirroring hard-drives. An

embodiment of the database server 302 is based upon the

15 following software platform: Linux 6.2, Apache web-server

with a VERISIGN-certified HTTPS connection, Oracle 8.1.5

database (which will be upgraded to Oracle 8.1.7), and

standard "ipchains" daemon-supplied with Linux for IP

firewalling chains.

20   In some embodiments, at each voucher receiving module

206, the card processor gateway 304 communicates with a

specific card processor. An acquirer module 210 typically

communicates with a local card processor (e.g. local

processor 214), whereas a database system 222 communicates

25 with one or more multi-currency card processors 218. In some

embodiments, the card processor gateway 304 requires the

following hardware platform: Intel processor PII-200 or

higher, PCI architecture, 64 MB RAM, 2 GB hard disk and 100

MB network card. Some embodiments of the card processor

gateway 304 utilize the following software platform: Linux

5 6.2, high-level physical secure connection to the processor,

and local firewall.

In some embodiments, the point-of-sale transaction

system utilizes an industry-standard database, communications

and security technology technologies. This may include, for

10 example, Cisco VPN security solutions. VPN is an enterprise

network deployed on a shared infrastructure employing the

same security, management and throughput policies that are

applied in a private network. A VPN used in accordance with

the present invention supports special protocols, high

15 reliability and extensive scalability, so as to make the

system more cost-effective and flexible. VPN can utilize the

most pervasive transport technologies available today: the

public Internet, service provider IP backbones, as well as

service provider of frame relay and ATM networks. The VPN

20 provides an extra security layer through access control,

encryption and extensive firewalls. Some embodiments of the

point-of-sale transaction may also include Compaq or Sun

servers are currently considered of the most scalable, load

balanced and reliable servers. Other computers, however, may

25 also be used.

Some embodiments also utilize Unix/Linux. Unix is a

powerful computer operating system which is heavily-utilized

due to its multi-user and multi-tasking capabilities,

flexibility, portability, electronic mail and networking

5 capabilities. In some embodiments, the servers of the present

invention are based on Linux, a flavor of Unix, which

provides maximum security, availability and compatibility

with an existing infrastructure.

In some embodiments, built-in Linux, Checkpoint and

10 Cisco firewalls provide industry standard protection against

hackers and support secure per-application access control for

IP traffic across perimeters of the networks described

herein. They provide the following advanced features:

Network level D-o-S detection and prevention to defend

15 networks against SYN flooding and packet injection; Audit

Trail to detail connections; real-time alerts to log alerts

in case of attacks or other suspicious conditions; basic and

advanced traffic filtering; network Address Translation (NAT)

for enhanced network privacy by hiding internal addresses

20 from public view; user access controls; and event logging to

allow administrators to track potential security breaches.

Some embodiments also comprise additional end-to-end

levels of encryption, securing data transmitted across the

networks. It will be appreciated by those skilled in the art

25 that the encryption may be by any suitable means, including

by way of example and without limitation, 3Des (Triple Des),

IPSec, special Cisco secure solutions or other software or
hardware encryption standards.   In addition, the point-of-
sale transaction system is preferably designed with
encryption algorithms, database management, and communication
5 protocols.   The point-of-sale transaction system uses very
strong firewall rules to deny all suspicious connections to
the database system and employs a high level of encryption
during the transmitting of all information.   In addition to
the VPN encryption, one embodiment uses an additional
10 encryption protocol to send the data in encrypted format.
Some embodiments also use HTTPS protocols in the case of a
problem with the voucher receiving module 206 (e.g. in a
situation wherein the voucher receiving module is not
available) whereupon the merchants 204 will be automatically
15 redirected to a database system 222.

One embodiment of the method of the present invention
performed using this system is now described.   The point-of-
sale terminal 100 requests the purchaser's choice of currency
for the transaction.   If the purchaser chooses a locally
20 processed currency (e.g. a default currency offered by the
merchant, for example), the cardholder 202 is requested to
confirm the transaction, based on the price that is displayed
on the display 102.   If the cardholder 202 does not confirm
the transaction, the point-of-sale terminal 100 prompts the
25 cardholder 202 to either select a different currency or to
cancel the transaction.

If the purchaser chooses a currency that is not locally

processed (*e.g.* that differs from a default currency offered

by the merchant), the point-of-sale terminal 100 recalculates

the transaction price based on this currency's most recent

5 exchange rate (*e.g.* that was most recently downloaded to the

terminal) and displays the converted price to the cardholder

202 on the display 102. The cardholder 202 is requested to

confirm the transaction, based on the converted price that is

displayed on the display 102. If the cardholder 202 does not

10 confirm the transaction, the point-of-sale terminal 100

prompts the cardholder 202 to either select a different

currency or to cancel the transaction.

If the purchaser has not canceled the transaction, the

purchaser's card is swiped in the card reader 104, which

15 captures the card's details together with the transaction

amount in the cardholder 202 choice of currency. The point-

of-sale terminal 100 then dials to the module site's RAS

router 310, which requests the merchant's authentication.

The point-of-sale terminal then sends the encrypted

20 transaction data, and awaits a real-time authorization status

response from the module site. If the point-of-sale terminal

has an Internet connection, the terminal connects to the

module site's web server 312 which requests the merchant's

authentication. The point-of-sale terminal then sends the

25 encrypted transaction data, and awaits a real-time

authorization status response from the module site. After

48

receiving authorization for the transaction, the point-of-

sale terminal 100 prints the purchaser's receipt from the

printer 108, which includes the transaction amount in the

purchaser's choice of currency and the local currency, if so

5 desired. If the authorization is declined for the

transaction, the point-of-sale terminal does not print a

receipt.

The transaction flow through the point-of-sale

transaction system is as follows. After receiving card data

10 from a cardholder 202, point-of-sale terminal 100

automatically requests the point-of-sale transaction system

to authorize the card transaction. In one embodiment, each

point-of-sale terminal is configured to automatically route

its transactions to a specific voucher receiving module 206

15 (e.g. either to an acquirer module 210 or to a delegated

module 216). The merchant's point-of-sale transaction

enabled point-of-sale terminal 100 that sends the transaction

to the voucher receiving module 206 can be referred to as an

initiating point-of-sale terminal 100. The voucher receiving

20 module 206 to which a point-of-sale terminal 100 directs a

merchant transaction can be referred to as the owner module

206a. The owner module 206a stores or owns all information

for all of the merchant's transactions, regardless of whether

the transactions are handled by the local processor 214

25 connected to the owner module 206a or by a multi-currency

processor 218 connected to a database system 222.

The following steps describe the routing of a transaction between the initiating point-of-sale terminal 100, the owner module 206a and, when required, a database system 222.

5   A cardholder 202 card is swiped in an initiating point-of-sale terminal 100, which captures the card's details together with the transaction amount in the cardholder's choice of currency. The initiating point-of-sale terminal 100 immediately encrypts transaction data, such as for

10 example and without limitation, the card details, the chosen currency, and the transaction amount in the chosen currency.

       If the initiating point-of-sale terminal 100comprises an Internet-enabled point-of-sale terminal 100a, the terminal connects via HTTPS and SSL to the owner module 206a web

15 server 312 which requests the merchant's digital signature for authentication. The initiating Internet-enabled point-of-sale terminal 100a then sends the encrypted transaction data via HTTPS and SSL, and awaits a real-time authorization status response from the owner module 206a. It will be

20 appreciated that if the owner module 206a is currently unavailable, transactions initiated from an initiating Internet-enabled point-of-sale terminal 100a can be automatically (e.g., with no intervention required) redirected through the VPN to the database system 222 of a

25 multi-currency processing system 212. Transactions directed to the database system 222 will be further discussed below.

If the transaction is not redirected, the initiating

point-of-sale terminal 100 dials in to the owner module 206a

site's RAS router 310 which requests the merchant's digital

signature for authentication. The point-of-sale terminal 100

5 then sends the encrypted transaction data, and awaits a real-

time authorization status response from the owner module

site.

The transaction is routed into the owner module 206a,

only after going through a sophisticated log-in by the router

10 306, preferably with a firewall option and access control

list, and then through the owner module's firewall server

308. The web server 312 or RAS router 310 sends the

transaction to the database server 302, which logs all of the

transaction details and preferably concurrently identifies

15 whether the transaction's currency (e.g., as selected by the

purchaser) can be processed by the local processor 214.

If the local processor 214 does process this type of

currency, the database server 302 reformats the transaction,

for example in accordance to the protocol required by the

20 local processor 214, passes it to the card processor gateway

304, and awaits a response. The card processor gateway 304

routes the encrypted transaction through a point-to-point

frame relay connection from the card processor gateway 304 to

the local processor 214 and awaits a response.

25   If, however, the local processor 214 does not process

this type of currency, the owner module 206a routes the

encrypted transaction to a database system 222 and awaits a

response. Also, if the local processor is currently

unavailable 214 (e.g. is not operational and does not return

any status response within a given time duration), the owner

5 module 206a routes the transaction to a database system 222

and awaits a response. Transactions directed to the database

system 222 will be further discussed below.

If the local processor 214 returns a pending transaction

status response, which response indicates that the local

10 processor 214 is pending a manual verification for

authorization, the owner module 206a preferably performs

several retries to route the transaction to the local

processor 214. If the local processor 214 is still busy, the

owner module 206a routes the transaction to a database system

15 222, and awaits a response.

If and upon receipt of an encrypted status response from

the local processor 214 (e.g. via a frame relay connection),

the owner module 206a logs the transaction status on the

database server 302. Preferably concurrently, and via either

20 the web server 312 which communicates to an initiating

Internet-enabled point-of-sale terminal 100a (via HTTPS and

SSL), or via the RAS router 310, which communicates with a

dialed-in initiating point-of-sale terminal 100, the owner

module 206a notifies the initiating point-of-sale terminal

25 100 of the transaction's authorization status. The mail

server 314 e-mails an automatically generated transaction

report to at least one of the merchant administrator 402, the

voucher receiving module administrator 400, the merchant 204,

and the cardholder 202. The routing of the transaction is

then completed.

5   As discussed above, however, the transaction may have

been redirected from the owner module to the database system

222 through a VPN (virtual private network) transmission

which is automatically encrypted. Such redirect might occur

for a number of reasons, including by way of example and not

10 limitations, when the owner module 206a is currently

unavailable; when the local processor 214 does not process

the type of currency requested by the cardholder 202, or when

the local processor 214 is unavailable.

        The transaction is routed into the database system 222,

15 only after going through a complicated log-in by the database

system's Cisco router (e.g., with the firewall option and

access control list) and then through the database system's

firewall server (not shown). Upon receipt of an encrypted

transaction, the database system logs the transaction details

20 on the database system's database server. Concurrently, the

database system 222 routes the encrypted transaction through

a point-to-point frame relay connection from the database

system's card processor gateway to the multi-currency

processor 218, and awaits a response.

25   Upon receipt of a status response from the multi-

currency processor 218, the database system 222 notifies

(*e.g.* via a frame relay connection) the initiating owner

module 206a and logs the transaction status on the database

server 302 of the owner module 206a. Concurrently, via

either the web server 312 which communicates with an

5 initiating Internet-enabled point-of-sale terminal 100a (via

HTTPS and SSL) or via the RAS router 310 which communicates

with a dialed-in initiating point-of-sale terminal 100, the

owner module 206a notifies the initiating point-of-sale

terminal 100 of the transaction's authorization status. The

10 database system mail server e-mails an automatically-

generated transaction to at least one of the merchant

administrator 402, the voucher receiving module administrator

400, the merchant 204, and the cardholder 202. The routing

of the transaction is then completed.

15   In some embodiments, the database system 222 has another

feature, namely, a service which periodically scans each

voucher receiving module 206 with which it is in

communication. If a voucher receiving module 206 was

formerly not operational, as soon as it becomes operational,

20 the database system 222 updates the voucher receiving module

206 with the missed transactions.

The present invention thus provides a system and method

that includes a multi-currency payment platform which uses

software to interface a point-of-sale terminal 100 with a

25 voucher receiving module 206 (*e.g.* either to an acquirer

module 206, 210 or to a delegated module 206, 216) or a

54

database system 222 so as to enable the point-of-sale

terminal 100 to download current exchange rates for

particular currencies. In addition, the present invention

discloses a system and method comprising a multi-currency

5 processing solution compatible with the realities of existing

business and finance infrastructure and practice.

When a cardholder 202 chooses to complete a transaction

in a particular currency, the point-of-sale terminal 100 will

be able to provide the purchaser with the exact amount the

10 cardholder 202 ultimately will be charged in that currency at

the time of receipt of the cardholder's credit card statement

or bank statement. The software gives the point-of-sale

terminal 100 the capability to recalculate the transaction

amount from the currency in which the merchant 204 has priced

15 the transaction (usually the local currency), and allows a

choice to be made as to the currency in which the transaction

will be processed. In other words, not only will the

purchaser know the currency exchange rate and the exact

price, but the transaction is processed in the cardholder's

20 currency of choice.

While the invention has been described and illustrated

in connection with preferred embodiments, many variations and

modifications as will be evident to those skilled in this art

may be made without departing from the spirit and scope of

25 the invention, and the invention is thus not to be limited to

the precise details of methodology or construction set forth

above as such variations and modification are intended to be

included within the scope of the invention.

WHAT IS CLAIMED IS:

1.   A method for processing a non-cash transaction at a
point-of-sale, the method comprising:

receiving a request to process the transaction in a

5 first currency;

determining whether the first currency constitutes a
locally processed currency;

if the first currency constitutes a locally processed
currency, processing the transaction through a local

10 processor; and

if the first currency does not constitute a locally
processed currency, processing the transaction through a
multi-currency processor in communication with one or more
authorization modules from which authorizations are received

15 for transacting in one or more currencies other than locally
processed currencies.

2.   The method of claim 1, wherein receiving a request
comprises receiving a request from a customer.

3.   The method of claim 1, wherein receiving a request

20 comprises receiving a request from a merchant.

4.   The method of claim 1, wherein determining whether
the first currency constitutes a locally processed currency
comprises comparing the first currency to one or more stored
currencies which may be locally processed.

25   5.   The method of claim 1, comprising, if the first
currency is not a locally processed currency, retrieving

stored exchange-rate information and determining a value of

the transaction in a locally processed currency.

　　　　6. The method of claim 5, comprising displaying the

transaction value in the locally processed currency in a

5 point-of-sale device.

　　　　7. A system for processing non-cash transactions in

multiple currencies, the system comprising:

　　　　a point-of-sale device for receiving a request for

processing a transaction in a first currency;

10　　　means coupled to the point-of-sale device for

determining whether the first currency constitutes a locally

processed currency;

　　　　a local processor for processing transactions in locally

processed currency; and

15　　　a multi-currency processor gateway for processing

transactions in non-locally processed currencies, the gateway

comprising a database storing currency exchange-rate and

means for communicating with one or more authorizers to

obtain authorization to process the transaction in the first

20 currency.

　　　　8. A method for facilitating a non-cash transaction in

a first currency at a point-of-sale, the first currency

comprising a currency other than a local currency, the method

comprising:

25　　　a merchant selecting a second currency in which to

receive payment;

directing a voucher for a value of the transaction in
the first currency to a voucher receiving module;

receiving at a multi-currency processor system from the
voucher receiving module the voucher for the value in the

5 first currency;

receiving at the multi-currency processor system a
voucher authorization for the value in the first currency;
and

sending payment for the merchant in a value in the

10 second currency.

9.   The method of claim 8, where the second currency and
the local currency are the same currency.

10. The method of claim 8, where the value in the first

15 currency has a current exchange-rate relationship with the
value in the second currency.

11. The method of claim 8, where the first currency is
chosen by a cardholder associated with the non-cash
transaction.

20

Fig. 1a

Fig. 1b

Fig. 1c

108

100

4,025.25 NIS
1,599.50 CHF

CHF
(SWISS FRANC)

102

104

QZ 1	ABC 2	DEF 3
GHI 4	JKL 5	MNO 6
PRS 7	TUV 8	WXY 9
Clear	0	Enter

106

Fig. 1d

AMOUNT RECEIVED
1,599.50 CHF
2/5/01

Signature

108

100

THANK YOU
MERCI

102

104

QZ 1	ABC 2	DEF 3
GHI 4	JKL 5	MNO 6
PRS 7	TUV 8	WXY 9
Clear	0	Enter

106

202   204

```
┌─────────────────┐          ┌─────────────────┐
│                 │    ①     │                 │
│   Cardholder    │  ───►    │    Merchant     │
│                 │          │                 │
└─────────────────┘          └─────────────────┘
                                 ②│    │↑⑨
                                   ▼    │
                             ┌─────────────────┐
                             │                 │   ─206, 210
                             │ Acquirer Module │
                             │                 │
                             └─────────────────┘
                                           ③
                                    ⑧
┌──────────┐      ⑤      ┌──────────────────┐    ④    ┌─────────────────┐
│          │  ◄───       │                  │  ◄───   │                 │
│  Issuer  │             │  Clearinghouse   │         │ Local Processor │
│          │  ───►       │ (Visa, MC, Amex) │  ───►   │                 │
└──────────┘      ⑥      └──────────────────┘    ⑦    └─────────────────┘

    224                         220                        212, 214
```
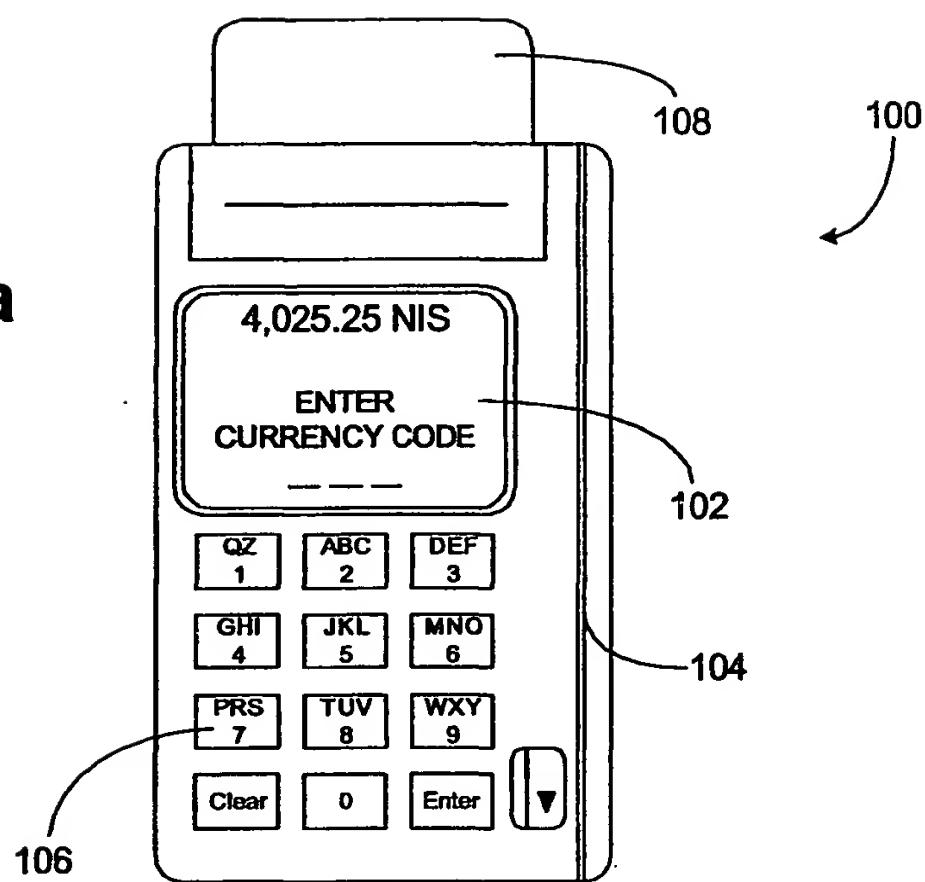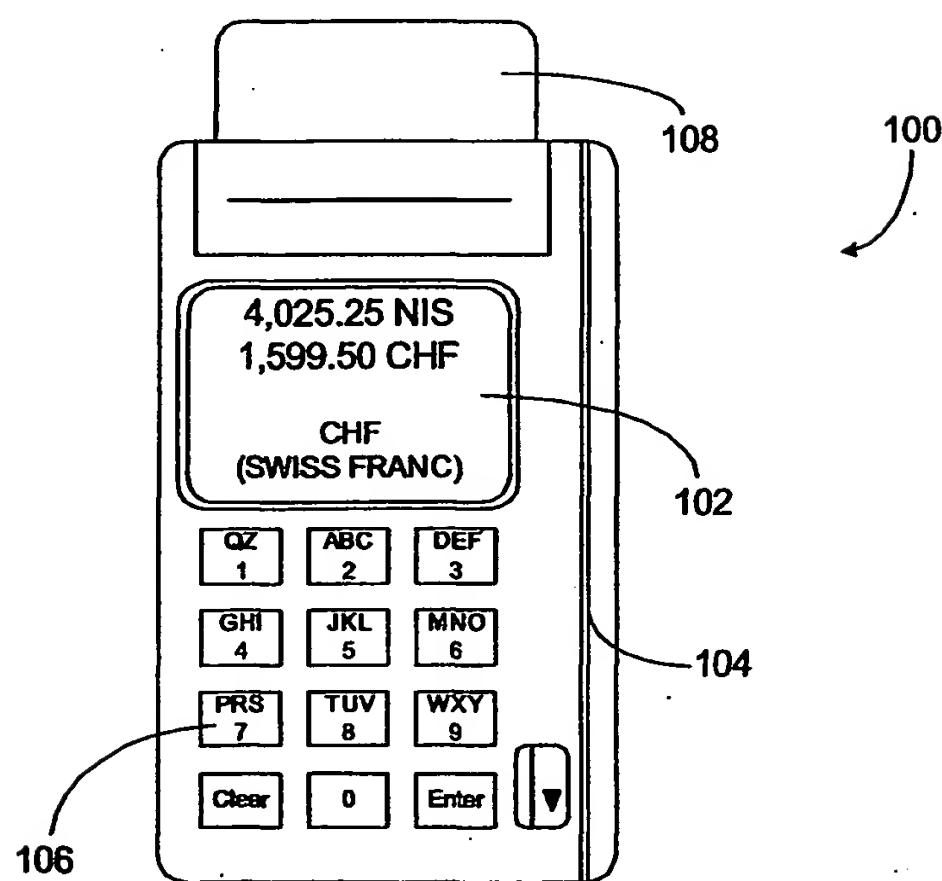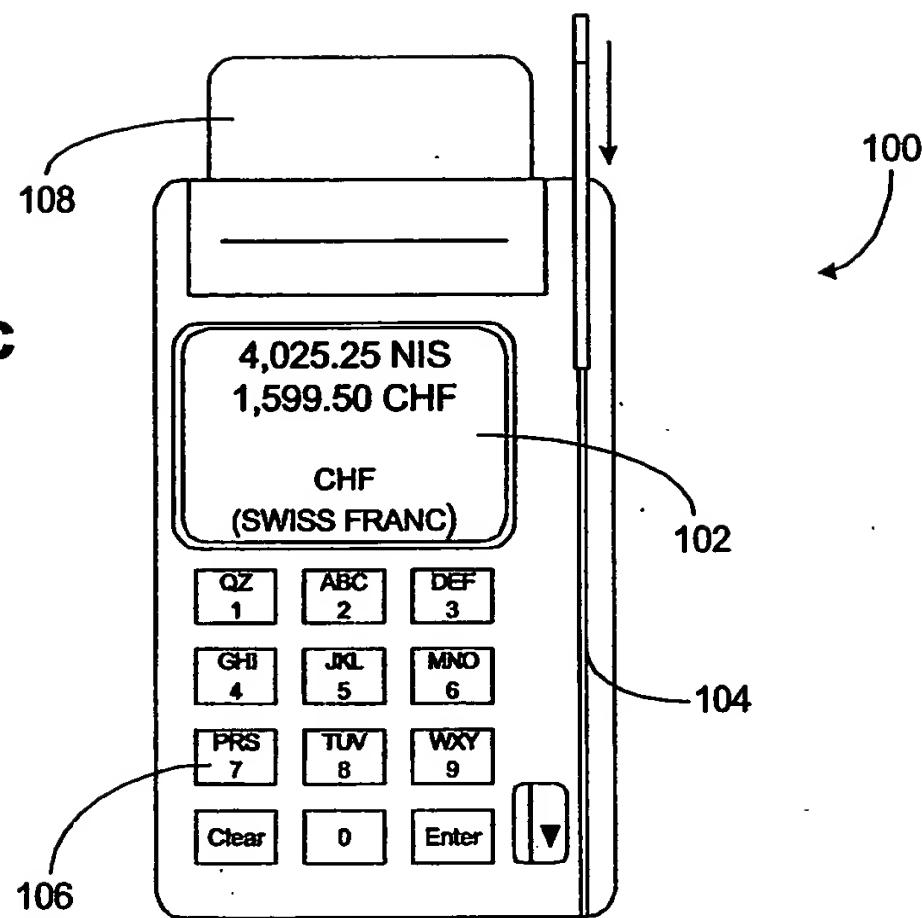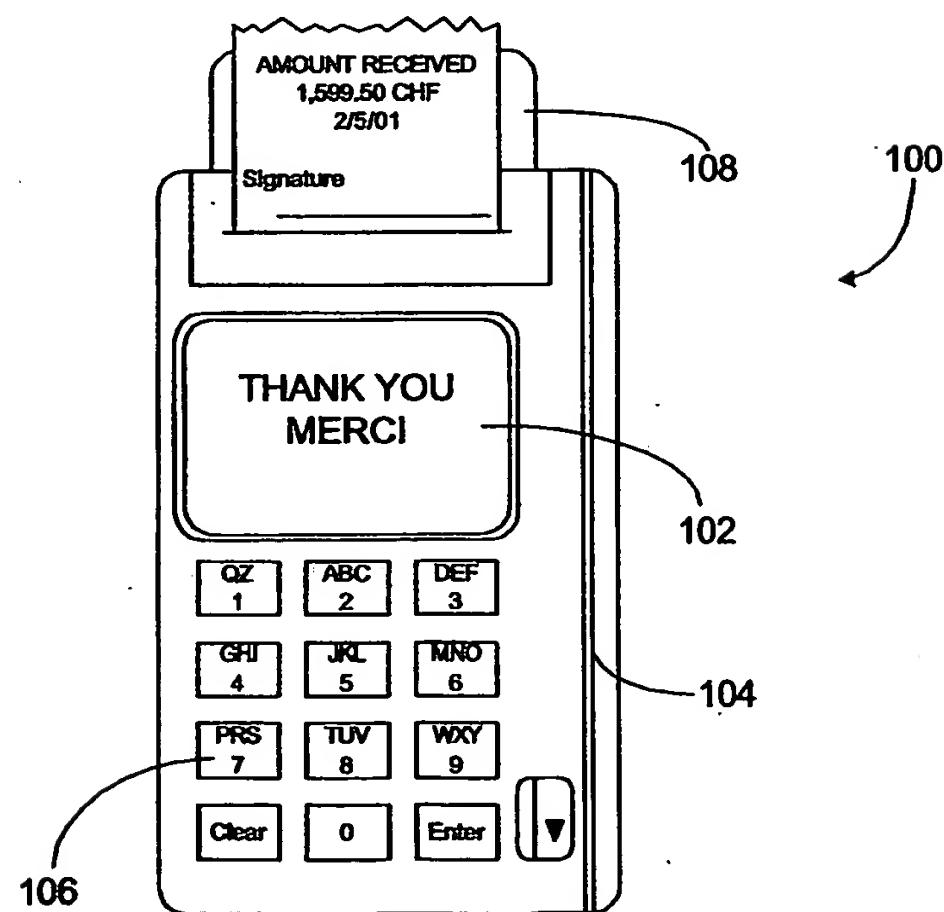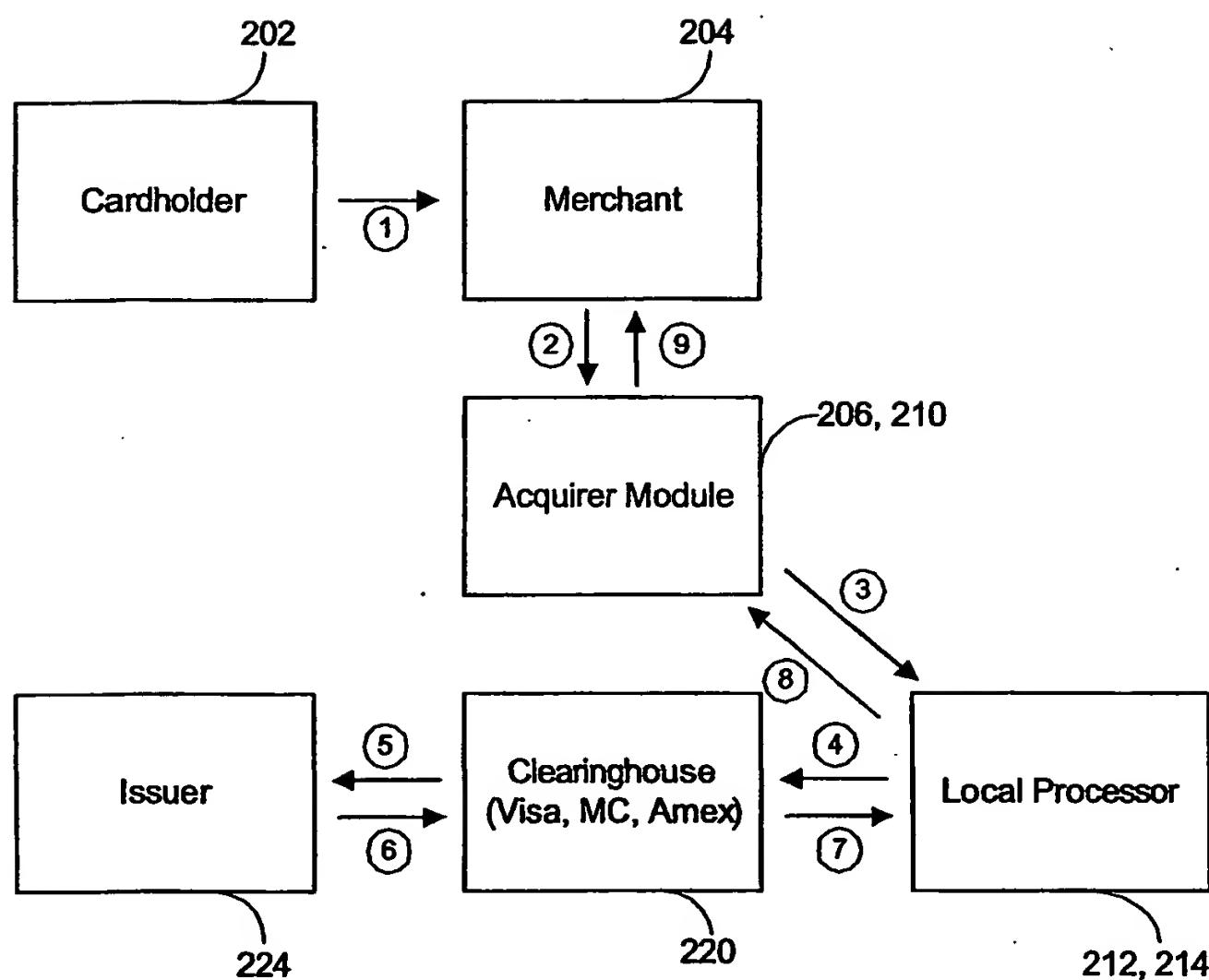
Fig. 2a
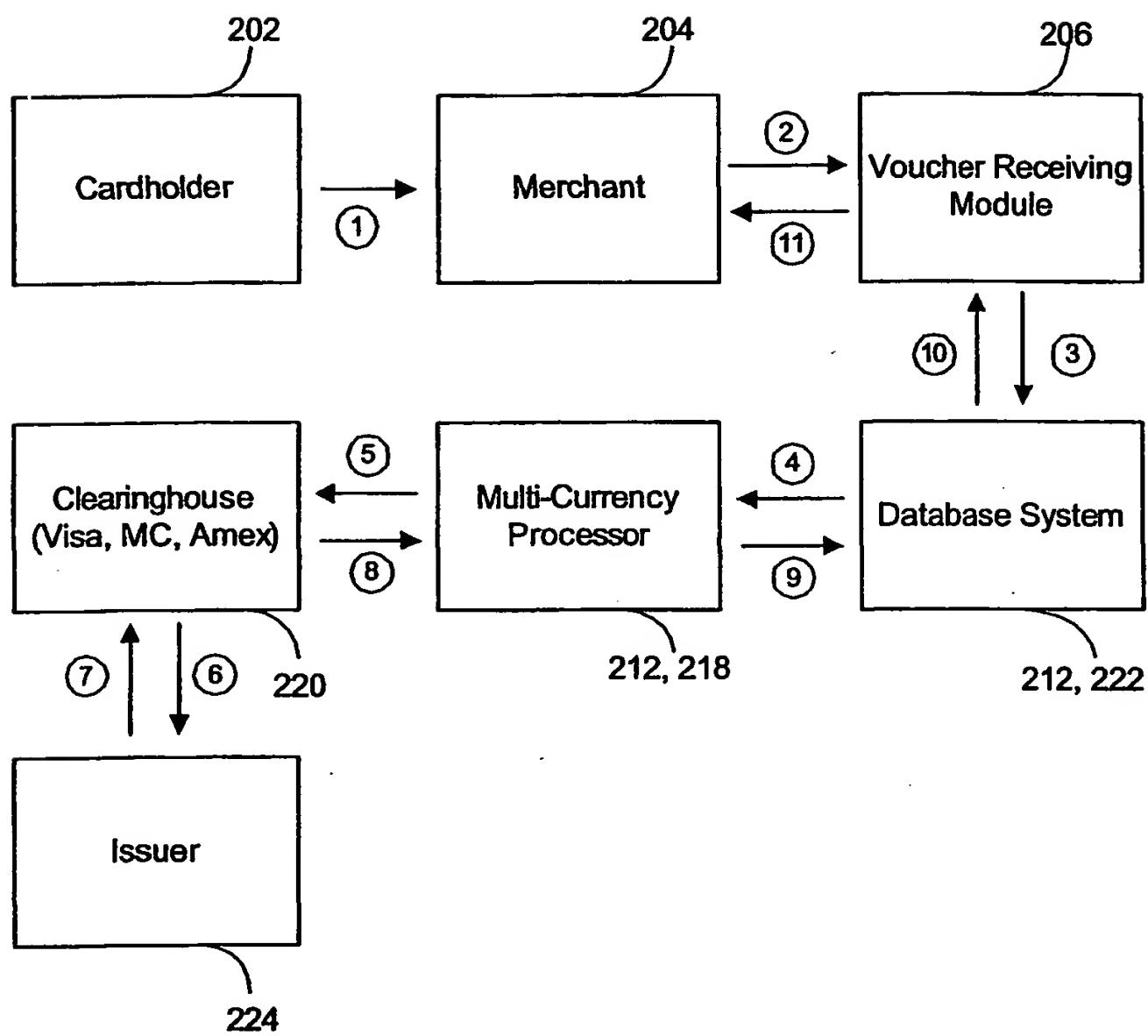
Fig. 2b
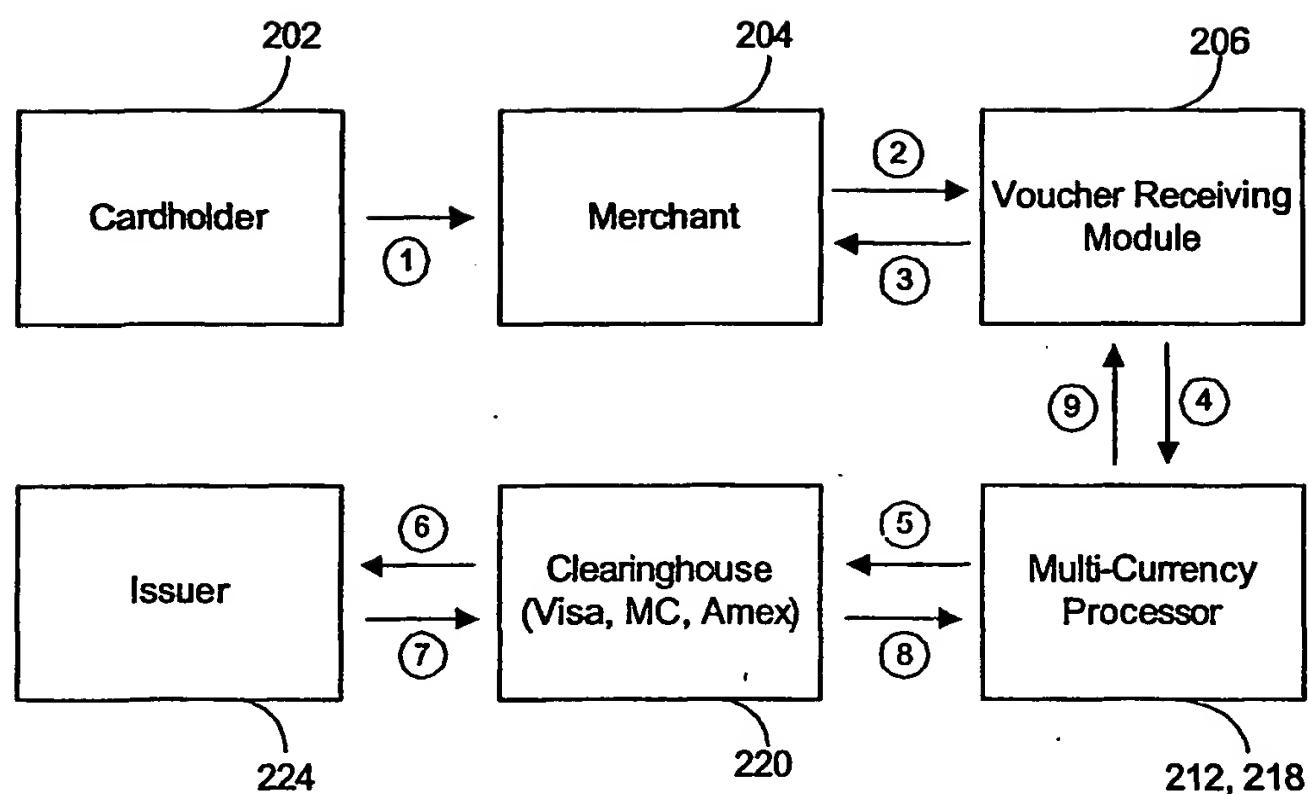
Fig. 2c
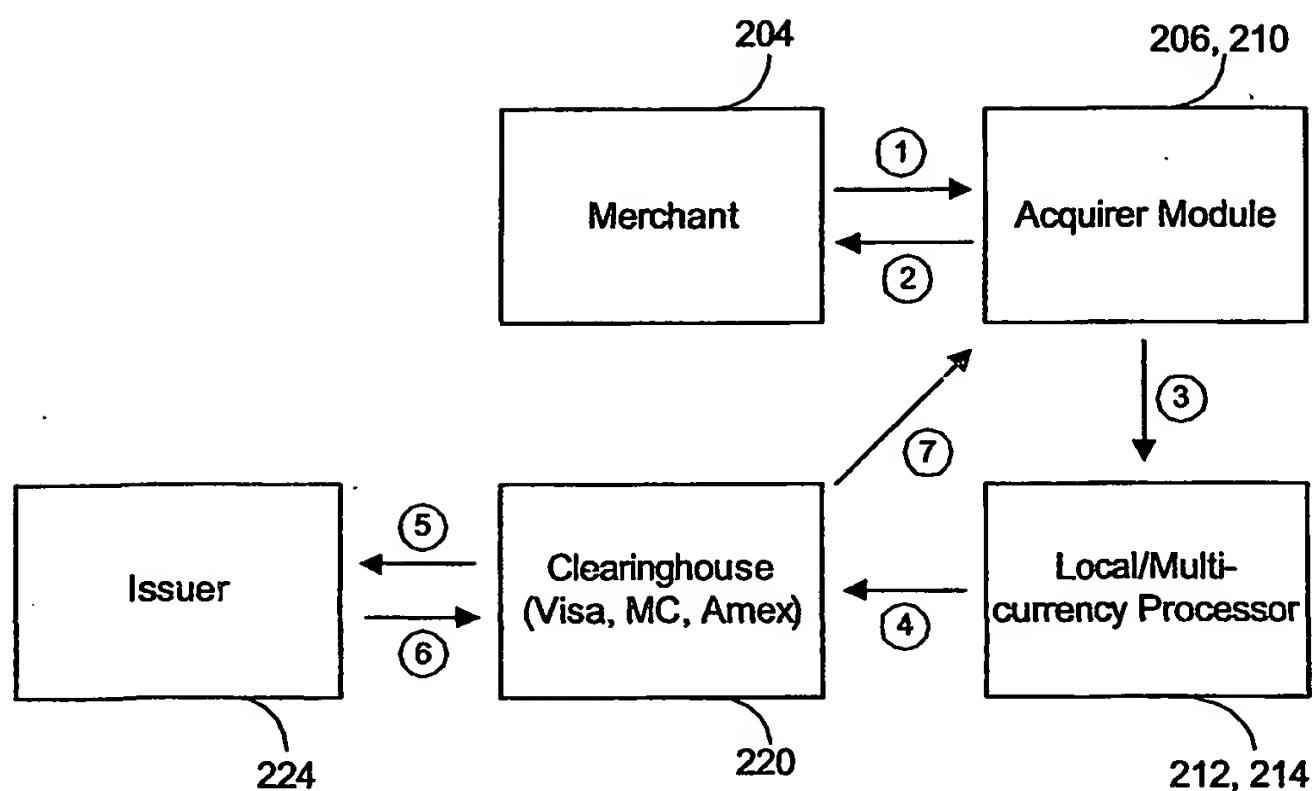
Fig. 2d
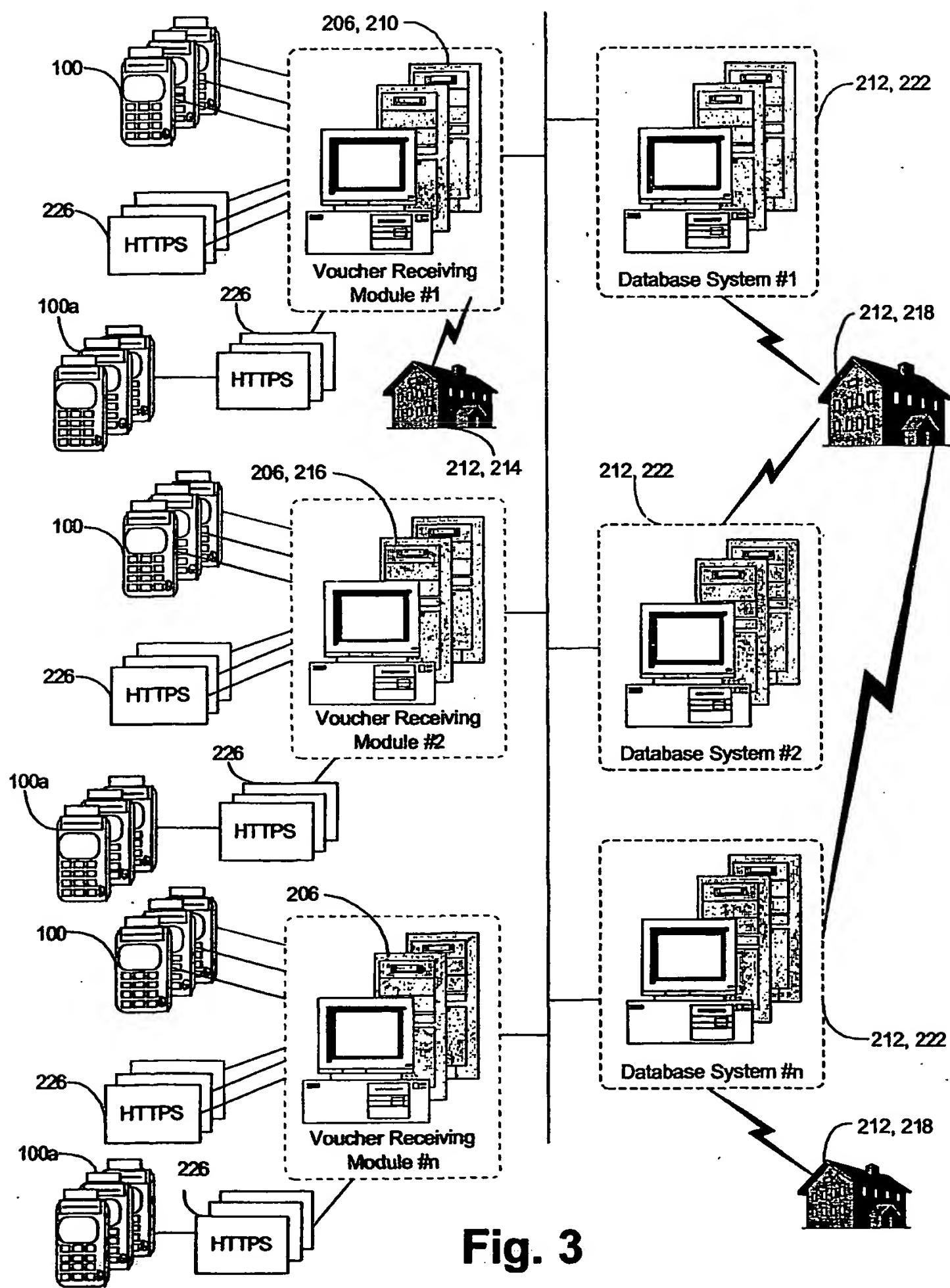
Fig. 3
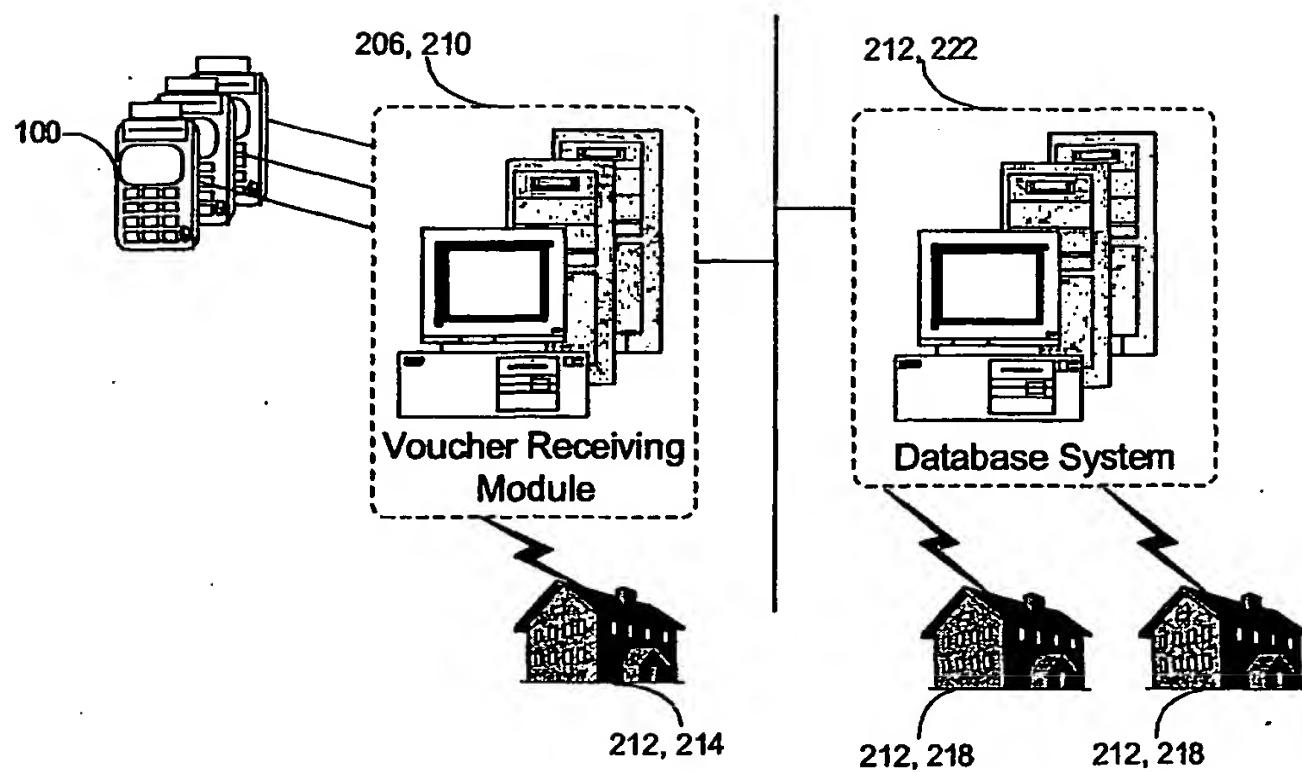
Fig. 4a
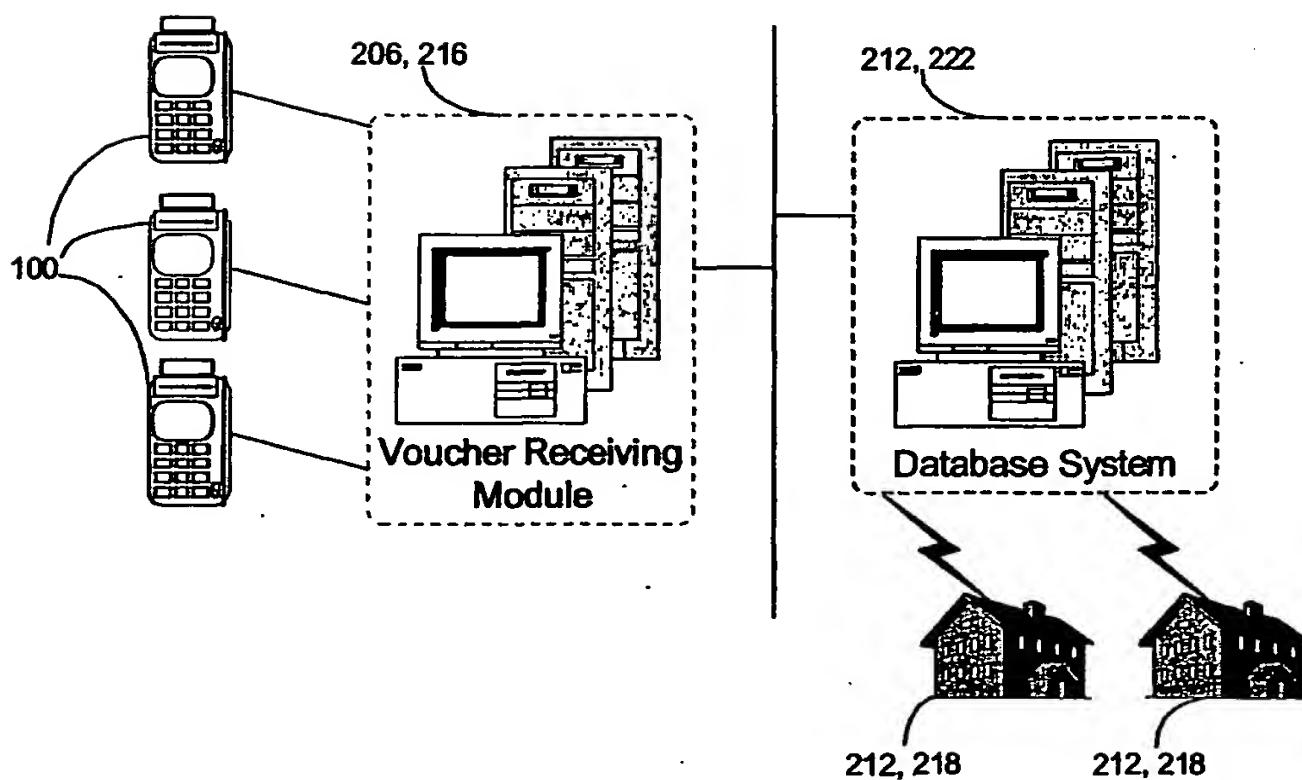
Fig. 4b
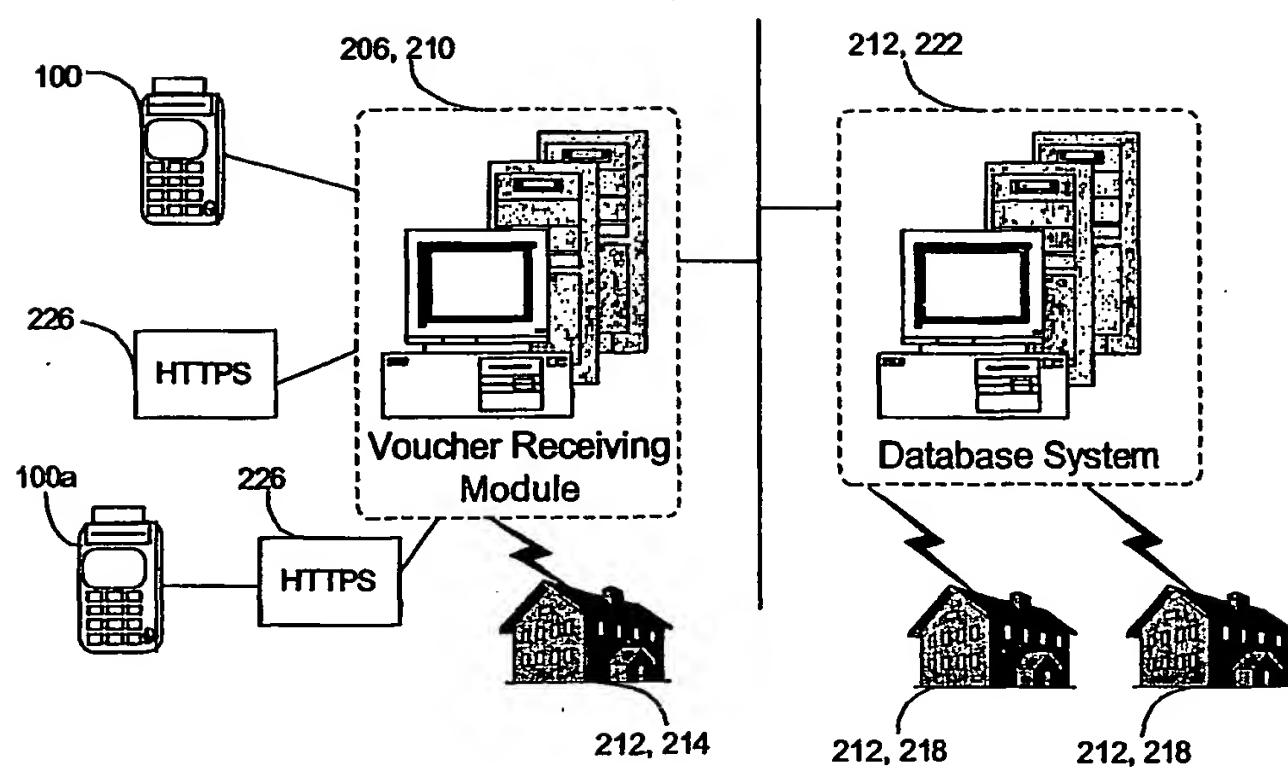
Fig. 4c
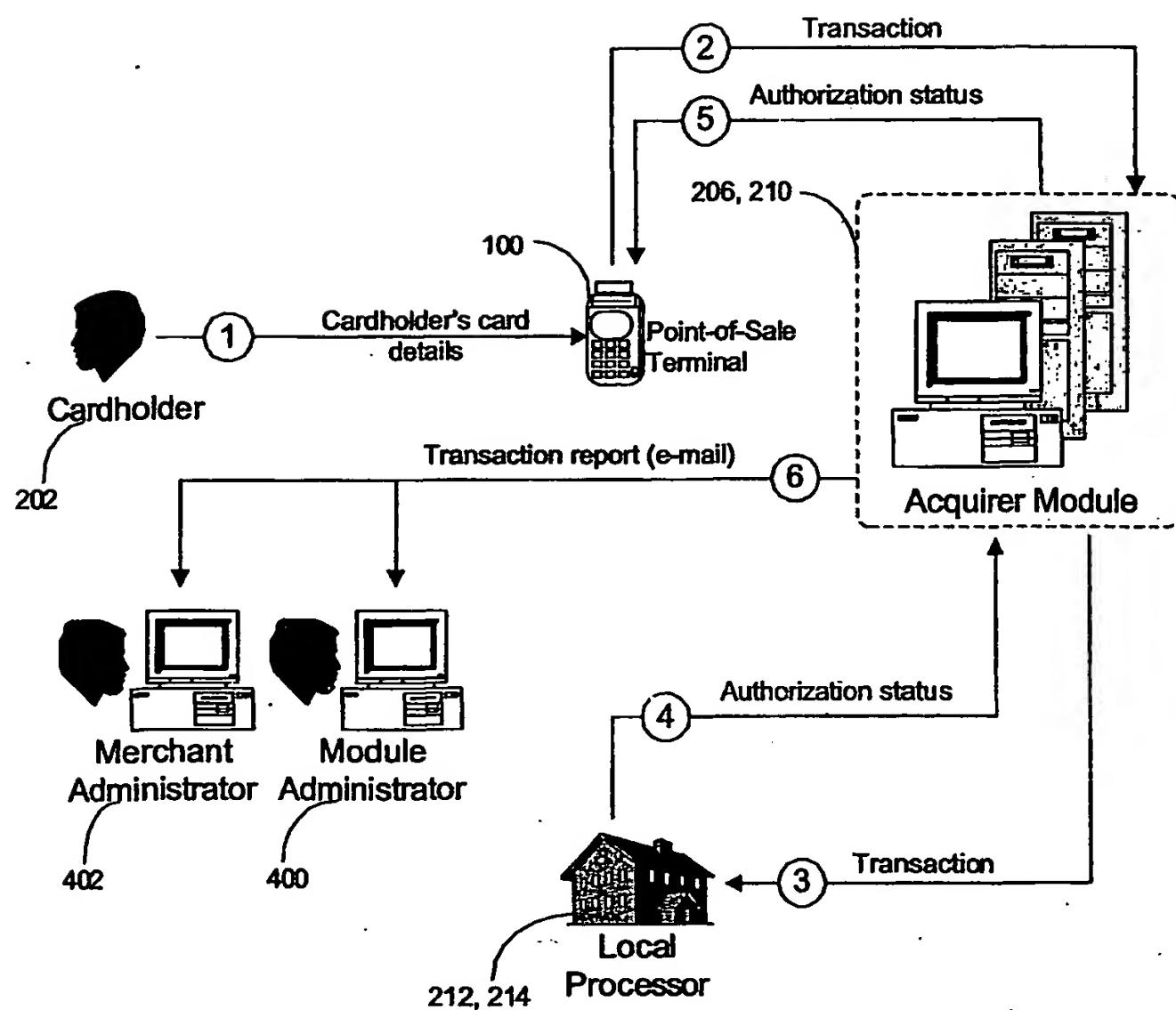
Fig. 5a

Fig. 5b

Fig. 5c

Fig. 5d

Fig. 6